

International Labour Conference

**EIGHTEENTH SESSION
GENEVA, 1934**

WORKMEN'S COMPENSATION FOR OCCUPATIONAL DISEASES

**PARTIAL REVISION OF THE CONVENTION
CONCERNING WORKMEN'S COMPENSATION
FOR OCCUPATIONAL DISEASES**

Fifth Item on the Agenda



**GENEVA
International Labour Office**

1933

Enquiries concerning the International Labour Office and its publications may be addressed either to the Office in Geneva, Switzerland, or to its Branch Offices :

GREAT BRITAIN: MR. M. R. K. BURGE, 12 Victoria Street, London, S.W.1. (*Telegrams: Interlab, Sowest, London; Telephone: Victoria 2859.*)

UNITED STATES: MR. L. MAGNUSSON, Jackson Place, Washington, D.C. (*Telegrams: Interlab, Washington; Telephone: District 8736.*)

FRANCE: MR. MARIO ROQUES, 205 Boulevard Saint-Germain, Paris, 7^e. (*Telegrams: Interlab, Paris 120; Telephone: Littré 92.02.*)

GERMANY: MR. W. DONAU, Scharnhorststrasse 35, Berlin, N.W.40. (*Telegrams: Burintrav, Berlin; Telephone: Norden D1 0011.*)

ITALY: MR. A. CABRINI, Villa Aldobrandini, Via Panisperna 28, Rome. (*Telegrams: Interlab, Rome; Telephone: 61.498.*)

INDIA: MR. P. P. PILLAI, International Labour Office (Indian Branch), New Delhi. (*Telegrams: Interlab, New Delhi; Telephone: 3191.*)

CHINA: MR. C. S. CHAN, 868 Bubbling Well Road (No. 109), Shanghai (*Telegrams: Interlab, Shanghai; Telephone: 30.251*); or International Labour Office (Nanking Branch), Ta Tsang Yuen, Ho Hwa Tong, Nanking (*Telephone: 22.983*).

JAPAN: MR. J. ASARI, International Labour Office (Tokyo Office), Shisei Kaikan Building, Hibiya Park, Kojimachiku, Tokyo. (*Telegrams: Kokusairodo, Tokyo; Telephone: Ginza 1580.*)

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PRINTED BY ATAR — GENEVA

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INTRODUCTION

The Draft Convention concerning compensation for occupational diseases was adopted by the International Labour Conference in the course of its Seventh Session (Geneva, 1925). It came into force on 1 April 1927, and has been ratified up to 1 August 1933 by twenty-two countries: Austria, Belgium, Bulgaria, Cuba, Czechoslovakia, Finland, France, Germany, Great Britain, Hungary, India, the Irish Free State, Japan, Latvia, Luxemburg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and Yugoslavia. Under this Convention the following are considered as occupational diseases: lead poisoning, mercury poisoning and anthrax infection, as set forth in the appended schedule¹, when such diseases affect workers engaged in the corresponding trades or industries enumerated in the schedule.

The Recommendation voted by the same Session of the Conference points out that each country is free to establish by its national legislation a more complete schedule of diseases than that appended to the Convention, and proposes that, where necessary, a simple procedure should be adopted for revision of the schedule of diseases that are regarded as occupational.

In submitting these texts to the plenary sitting of the Conference, the Committee on this subject expressed the wish that the question of extension of the schedule should be placed on the agenda of a future Conference, and, if possible, as early as 1926. The Office accordingly requested the Correspondence

¹ Cf. p. 52.

Committee on Industrial Hygiene to study the revision of the 1925 schedule, and the deliberations of this Committee in 1926, and later in 1928, resulted in the schedule submitted in those years to the Governing Body of the Office.

Later the resolution presented by Messrs. Müller and Schürch requesting that an extension to the schedule (to comprise silicosis) should be placed on the agenda of the next Conference was adopted at the 1931 Session, and more recently a similar resolution by Mr. Schürch was adopted at the 1932 Session of the Conference.

After a preliminary discussion (Sixtieth Session, Madrid, October 1932), the Governing Body decided at its Sixty-first Session (Geneva, February 1933) that the extension of the schedule of occupational diseases appended to the 1925 Convention, comprising the inclusion of silicosis, should be placed on the agenda of the 1934 Conference in the following form :

“ Partial revision of the Convention concerning compensation for occupational diseases with a view to :

“ A. Inclusion in the schedule appended to Article 2 of this Convention of the following occupational diseases :

“ Silicosis ;

“ Poisoning by phosphorus and its compounds or its sequelae ;

“ Poisoning by arsenic and its compounds or its sequelae ;

“ Poisoning by benzene, its homologues and nitro- and amido-derivatives or its sequelae.

“ Poisoning by hydrocarbons of the aliphatic series and their chlorinated derivatives or its sequelae.

“ Pathological manifestations due to :

“ (a) Radium and other radio-active substances ;

“ (b) X-rays.

“ Epitheliomatous cancer of the skin.

“ B. Substitution for Articles 3-10 of the Convention of new articles in the style of those adopted at the 1929 Conference.”

It should be noted that in placing this question on the agenda the Governing Body has done so in the special form of “ *Partial Revision* of the Convention concerning compensation for occupational diseases ”. It might have worded the item in the more usual way somewhat as follows: “ compensation for the following occupational diseases: ”. The Decision of the Governing Body to ask the Conference to deal with the question by way

of revision of the existing convention on occupational diseases very much simplifies the task of the Conference. The Conference is not called upon to decide the form of the convention nor the kind of obligations which it will involve. These questions have already been settled in the 1925 Convention on occupational diseases. All that the Conference has now to do is to decide whether it will add certain diseases to the list which the 1925 Convention already contains.

This task, as the Governing Body has indicated, is in fact one of partial revision of the existing Convention. It is, however, a case of revision somewhat different from those with which the Conference has already dealt or for which the Standing Orders of the Governing Body provide, in so far as its origin is not a proposal of revision by any particular Government, or the result of the Governing Body's examination of the ten yearly report on the working of the Convention in question. It has been placed on the agenda of the Conference by the Governing Body in virtue of its powers under Article 400 of Part XIII.

In those cases of revision for which the existing Standing Orders of the Governing Body and the Conference provide the decision of the Conference is taken at the session at which the question comes up for discussion. As regards the present question the Governing Body decided that, as the Standing Orders did not specifically envisage such a case, the Conference should be left free to decide whether it would apply the procedure of single or double discussion.

Without wishing in any way to influence the decision of the Conference on this matter the Office thinks that it will be useful to indicate certain considerations which the Conference will no doubt wish to weigh before deciding on the course which it will follow.

In the first place, as pointed out above, the Conference is not required to discuss and decide on the form of a Convention and on the nature of the obligations which it will give rise to. The Conference has only to decide whether it will add certain diseases to the existing list and the wording which it will employ to define those diseases. Apart from the political question as to whether States are willing or not to assume obligations in respect of these diseases, the questions involved are essentially technical in their nature. These technical aspects of the matter have been carefully studied by a group of specially chosen experts,

members of the Industrial Hygiene Committee of the Office, and the present report furnishes the Conference with the conclusions of that Committee. No doubt various delegations will include experts who are competent to examine the opinions expressed by the Industrial Hygiene Committee, but given the limited nature of the task before the Conference, Governments will no doubt consider whether it is necessary to bring such experts to two successive sessions of the Conference or whether sufficient opportunity would not be afforded during a single session for the formulation of their views.

If the Conference should decide that a second discussion is desirable the present report contains all the elements which the Conference will require to settle the points on which Governments are to be consulted in the interval between the two sessions. It will be noted that such consultation can only bear on the limited question of the content and wording of the additions to the existing list of occupational diseases. The more general consultation usually undertaken was made preparatory to the adoption of the existing Convention, and as the Conference is not asked to revise the operative Articles of the Convention the renewal of that general consultation is unnecessary, and is in fact excluded by the terms of the item on the agenda.

If the Conference on the other hand should decide to proceed by way of a single discussion it will have before it in the present report a draft of the proposed additions to the list of occupational diseases which it can take as the basis of its discussion.

* * *

It will be noticed that the question on the agenda includes a second paragraph, B, which relates to the substitution for Articles 3-10 of the existing Convention of the new standard articles approved by the Conference in 1929. The Articles in question are those which relate to the registration of ratifications, the coming into force of the Convention, its denunciation, revision, etc. It is clearly desirable that so far as possible all the Conventions should be uniform in this regard. The existing Convention, which was adopted in 1925, contains the old standard Articles. As it was coming before the Conference for partial revision the Governing Body decided that this provided an opportunity for bringing its formal Articles into line with the

more recent decision of the Conference. In order that this might be done it was necessary that the Governing Body should specify that the partial revision put on the agenda of the Conference should include the revision of the formal Articles and this explains the inclusion of paragraph B. The changes proposed, which are of a purely formal character, will be found in pages 318-319 of the present report. It will be sufficient for the Conference, if it agrees, to instruct the Drafting Committee to make these changes when it prepares the text for the final approval of the Conference.

FIRST PART

COMPENSATION FOR OCCUPATIONAL DISEASES

The development of the legal concepts which for the past fifty years have governed legislation relating to industrial accidents is too well-known to need detailed description. It will be sufficient for present purposes to recall the main stages in the change from the simple application of common law to the establishment of the principle of occupational risk.

Under the ordinary general law (civil liability) the victim of an accident or his dependants could obtain compensation by proving the employer's liability for the cause of the accident or by proving him to be at fault in the matter. Responsibility, therefore, lay with the worker in regard to accidents due to fortuitous causes, cases of *force majeure*, or unknown causes, as well as in the case of those due to his own fault, however slight. Further, even when the employer could be held responsible, the victim might only establish a claim to compensation by proving before the courts some negligence or culpability on the part of the employer (*in agendo, in negligendo*). Since this represented for the worker a matter of great difficulty, or even of impossibility (*actori non probanti, reus absolvitur*) he and his dependants were inclined to abstain from making a claim in order to avoid expense, loss of time and possibly failure.

It might have been possible to make appeal under the system of contractual liability in accordance with which the worker's right to compensation is based not on the guilt of the employer but on breach of the contract for the hire of service. Such contract obliges the employer to ensure the safety of his workers and to enable them at the expiration of their work to leave his establishment safe and sound ; in other words it imposes on him the obligation of compensating injuries unless they are due to a fault imputable to the worker, a fortuitous cause or *force majeure*. This new conception, the effect

of which was to transfer the onus to the employer or, as has been said, to "render the employer liable for safety", eliminated the necessity for attempting to confirm responsibility on the part of the employer except where intention was alleged. Further, the plea of breach of contract is in general more favourable to the worker than that based on civil liability, the guilt of the employer being assumed from the outset and the time bar being longer than in the case of civil procedure.

With the development of industrial organisation, however, the situation in which victims of occupational diseases found themselves began to claim the attention of public opinion, which demanded a solution based on conciliation and fair treatment rather than on the abstract legal interpretation of definitions. It was no longer possible for industry to remain indifferent to, or ignorant of, the danger inherent in its machinery or its complex organisation, apart from any consideration of negligence on the part of the employer or the employees.

At this stage there arose the conception of the principle of legal liability or of "created risk" (= *risque créé*) referable to an objective material fact which is thus substituted for the conception of culpability.

This conception, which was somewhat more favourable for the worker, was rapidly replaced by that of "occupational risk", which, however, led to the same conclusions, at least as regards accidents due to the fault of the employer or to fortuitous causes.

According to the principle thus accepted, the occurrence of inevitable accidents constitutes in its entirety an "occupational risk" the cost of compensation for which is rightly to be reckoned as an element on the debit side of general working expenses and therefore to be borne by the industry as an overhead charge of the undertaking ¹.

Though the principle of occupational risk does not, under some legislation, exclude either a measure of appeal to the ordinary general law or the conception of culpable conduct on the part of the employer or the employee, the principle henceforth covers accidents due to general risks connected with the

¹ In the last few years this fundamental point has been the object of a highly interesting discussion on criteria of occupational risk as a function in the organisation of accident insurance considered to be based on an erroneous conception (see contributions by Aries (1932); Fantini (1931); Buffa (1932); Weddiger (1931); Richter (1931); etc.).

industrial undertaking, to fortuitous causes as well as those to be imputed to carelessness, awkwardness, or even slight but unintentional negligence on the part of the worker, or to faulty organisation of the work and lack of foresight on the part of the employer. It is from the taking into account of all these conditions that there has developed the system of compensating injury, not in its entirety, but by means of a partial indemnity paid once and for all in the form of a lump sum.

The logical and direct consequence of legislation of this type has been to give a stimulus to measures for reducing, as far as possible, the number of accidents and cases of disease, or, in other words, for diminishing risks and consequently reducing insurance premiums.

Once legislative provision had been made for compensation for accidents in accordance with this new principle, the question immediately arose: why should such compensation not be extended to cover occupational diseases? If compensation was accorded for a sudden, unexpected and violent injury, why not give compensation also for a slowly acquired injury inseparably connected with working materials or even working conditions?

In the course of discussions in the Parliaments of different countries — in France, Great Britain, Italy, etc.¹ — on Bills dealing with accident compensation, this question was repeatedly asked; but without success. Even in countries (for instance, in Germany) where legislation had made provision for the extension of insurance to the diseases in question, the Governments did not for many years, even for decades, take advantage of this provision.

The situation created with regard to occupational disease by the adoption of accident compensation was illogical and unjust. The new legislation afforded compensation to the victim of an accident in an establishment which complied with all the safety rules and regulations, even should the accident occur on the day of the worker's engagement and be due to his own negligence. Nor was any effort made to investigate the medical history of the victim or to consider circumstances attenuating the responsibility of the employer. On the other hand, in nearly all countries, there was no provision for compensating the healthy worker or paying any benefit to his dependants when, as a result of industrial poisoning, in the

¹ For detail, cf. below, Second Part, pp. 57 et seq.

course of a few months or a few years, he met with serious injury to his health or even with death. The employer, fully aware of the risk involved in his establishment, did not trouble to take the most elementary precautions and failed to follow those provided by existing regulations, with the result that the worker was constantly in imminent danger even where he himself took the most minute precautions to protect himself against the noxious effects of the poisoning or of the infection insidiously hidden in the material handled.

It was argued that the fact that the worker was aware of the risk implied his acceptance of it when he agreed to work in the factory. It might be replied that the injury which interfered with the worker's source of production and earning capacity — his health — ought to be compensated by the employer who utilised that source, more especially since the risk was one from which the worker was powerless to escape and to which he must inevitably succumb (*fatale damnum*).

It was further alleged that the carelessness of the worker or his lack of personal hygiene constituted a factor liable to favour the outbreak of disease or aggravate the risk of poisoning. But how many doctors have not known patients who were the victims of occupational disease and who were nevertheless careful and cleanly in their habits? In the absence of all measures tending to diminish or eliminate occupational risk, especially where it is known, it is not to the victim that negligence and responsibility should be imputed¹. How is he able, for instance, to pick out from among the thousands of hides of uniform appearance which he handles the one in which danger lurks in the shape of an anthrax spore? How may he protect himself against noxious fumes, very often colourless and odourless, which escape undetected from the plant or piping because of defective exhaust apparatus?

DEFINITION OF OCCUPATIONAL DISEASE

It is a matter for astonishment that protection of health, which is a fundamental duty of the State, should not have been

¹ There should be noted in this connection the importance of the decision of the Labour Magistrature at Rome, which has placed on the employer the responsibility for eliminating all causes harmful to the health of his workers. The importance of this decision consists in its general scope, apart from any legislative procedure, and in the obligation thus laid on the employer to adopt special measures of protection for the industries in question (April 1933).

better understood by the responsible authorities, the more so since it is obvious that injuries due to occupational disease are of more serious import both from the aspect of the individual and of society than those caused by accidents. In fact, disease in most cases attacks the whole system and, in the case of poisoning, the most important organs of the body. It brings about serious and deep-seated destruction of health and often exerts an effect on progeny and the race, and in general on resistance to the action of infectious or morbid agents.

It is true that, according to the experience of the last few years, a great many cases no longer attain the same gravity as formerly, and are no longer attended by the same grave economic consequences. This progress must be ascribed to the adoption of hygienic and social measures of protection. But whilst technopathies are less frequent than they were some years ago, this fact does not suffice to justify denial of the occupational risk and does not obviate the necessity for compensating its consequences. Further, does there not exist a closer relationship between cause and disease in the case of occupational disease than in that of industrial accident? It, is, of course, true that not all the diseases from which workers suffer are of occupational origin. Nevertheless, how often — quite apart from the occurrence of technopathies — is the factor responsible for the outbreak of disease not to be found in the occupation followed by the victim?

As regards definition of occupational disease, it should be noted at the outset that, even in the case of accidents, it has most commonly been the practice in legislation to avoid any definition other than a theoretical one. According to this theory, an accident is "any organic or functional injury to the health as well as any physical modification due to an exterior, sudden and violent cause arising out of or in course of work and causing either death or absolute, or partial, permanent or temporary incapacity for work". The chief factors in this definition are therefore "the action of an external cause operating in the manner of an unforeseen, sudden and violent occurrence" and the qualifying phrase "in course of work".

Legislation does not, however, always provide the definition of the "violent cause" in its chronological or other relation to injury to health or life. Whether the effects do not become manifest immediately after the action of the violent cause, or whether they follow an acute or chronic development, their

A fourth group of definitions covers a conception of occupational disease based on the definition made for the first time in 1897 by Dr. Glibert, who characterises the "incidence" of occupational disease as being unusually high amongst individuals following a particular occupation.

The fifth group comprises definitions concerned with "diatheses" (Boucher), which assimilates occupational disease to clinical syndromes of this type, and which stresses the conception of the "fatal effect" inherent in the continual exercise of the occupation (Debray).

It was imagined that the difficulties connected with the above definitions could be overcome by formulating a "complex" definition embracing various characteristics of occupational disease (Van der Borgh, Devoto, Carozzi, Ranelletti, etc.). Finally there is the definition of Petri which comprises two disease groups : those specific to the occupation and those which, whilst occurring generally amongst the general population, exclusive of industrial workers, nevertheless show a higher incidence rate for workers in certain industries. Professor E. Martin is inclined to favour this solution of the problem. Mention should be made of the fact that Cernelutti had previously referred to a "specific risk" peculiar to and directly deriving from the intrinsic conditions of the industry in question, and threatening the workers engaged therein, and to an "indirect risk" which "independent of the specific conditions in the industry as regards its existence depends thereon nevertheless as regards its intensity, or, in other words, finds in the industry a source of aggravation or extension, with the result that whilst threatening alike those belonging to the industry and those outside it, endangers the former group nevertheless to greater extent".

On review almost all these definitions are certainly open to criticism. To begin with, it is somewhat difficult to accept the very restricted conception limiting occupational disease forms to "diatheses". Further, care must be taken not to uphold definitions the elements of which are likely to make for the exclusion of certain occupational diseases, those, for instance, which introduce the conception of length of time, be it in regard to the work or in regard to the action of the harmful agent. It is, in fact, not always necessary to have been "habitually" engaged on certain work or to have been exposed "over a long period" or in a "lasting and continuous manner" to risk involved by a certain unhealthy trade in order to fall a victim to an occupational disease. How many newly engaged workers or temporary workers have often been known to suffer from these diseases! In such instances, accidental or intermittent exposure has sufficed to set up consequences at times of the gravest nature.

Neither is the "cumulative effect" of harmful agents indispensable to the outbreak of occupational disease, despite the fact

that certain authorities consider chronic poisoning as the result of attacks of short duration, followed often by fairly long periods of at least apparent immunity, without possibility of considering the case as an accident within the legal sense of the term.

Even the conception of the disease as "the distant consequence" of an unhealthy occupation or as "slow poisoning" cannot be readily accepted, since it does not cover cases of infection or poisoning which develop in a fairly short space of time. Are there not, for instance, cases in which a single though effective dose of pathogenic germs (anthrax and tetanus spores) may in a relatively short time, often the first day of work, give rise to disease under circumstances which would prevent its inclusion within the definition provided in certain legislation for accidents ?

It would be still more difficult to accept the description of the "direct" or "exclusive" action of the occupation, or to admit such qualifications as the "certain consequence" or the "inevitable consequence" in full knowledge of the rôle played by the personal factor or by certain effects on the system, and which might doubtless prevent the trained medical man from certifying the disease as being "exclusively" or "essentially" occupational. It is hard to understand how the medical man, even after long experience of assessing such cases, can always be expected to establish the relation of cause and effect between the disease and the substance enumerated in the schedule when, for instance, many harmful substances may be present simultaneously in the workroom. The incidence of forms of mixed poisoning is much greater than might be imagined, more especially under modern organisation of the chemical industry. Cases of poisoning have even been known to occur as the result of unforeseen reactions bearing no direct relationship to the industrial operations in question. There may be quoted in this connection those due to phosphoretted hydrogen liberated from the residues of molten ore containing phosphorus, on which hot water has been poured.

Finally, the element of "incidence" comprised in certain definitions possesses the great advantage of assuring inclusion amongst the technopathies of those common diseases which may assume, under certain conditions, special importance. Nevertheless, the practical application of this solution

encounters serious obstacles. Returns showing the incidence of occupational diseases can only be provided by a competent service subsequent to long and patient enquiry, or by a critical and detailed study of sickness fund statistics. As regards mortality, valuable information is provided almost exclusively by English statistics. However that may be, the fact must not be lost sight of that many ordinary diseases occurring among workers constitute the cause of frequent absence and are a heavy burden on the industrial economy, and that certain diseases — more particularly tuberculosis — may develop into an occupational disease whenever the victim is employed in an occupation particularly liable to the propagation of specific contagion (those in the nursing profession, laundry workers, etc.), or in which the working conditions are likely to provide a favourable medium for its outbreak (tuberculosis engrafted on pre-existing silicosis).

Faced with the difficulty of defining the subject of compensation and having, on the other hand, to satisfy practical necessity and the pressure of public opinion, legislative authorities had recourse to the simple solution of assimilating occupational diseases to industrial accidents. Moreover, as has been stated, the courts in making legal awards had already adopted this procedure in according benefit under accident compensation legislation in many cases of acute poisoning, of infection, and even of sub-acute disease forms of confused nature, partaking both of the nature of an occupational disease and of an accident. In regard to these "border cases" the courts had deemed to be "violent" such conditions as sunstroke or the action of a toxic substance on every occasion on which the harmful energy liberated was sufficiently intense to set up organic disorders leading to disease or to death. Similarly, it was considered applicable to the action of biological agents (pathogenic micro-organisms, parasites) — the element of "violence" being here identified with "virulence" — more especially in such action as that exercised on a single or on several occasions occurring within a short space of time. In this connection it is not the micro-traumatism represented by the modus of entry (bite, injury of the tegument, etc.) of the pathogenic agent which is taken into consideration, but the violence or virulence manifested subsequent to invasion of the system when the agent in question — a true form of biological

energy — sets up by propagation phenomena of diverse nature, but of such qualitative and quantitative intensity that it causes serious disease. This cause of injury capable of producing direct or indirect pathological effects in a concentrated period of time is most usually connected with specific employment (anthrax : hides, hair, anthrax-infected animals; glanders : animals suffering from glanders, laboratory research; tetanus : agricultural work, gardening or rag sorting). Whilst it may be difficult at times to say exactly “when” or “during what period of time” the victim has been exposed to the risk, it is, on the other hand, possible to specify the chronological period (period of incubation) and consequently its connection with the work engaged in.

It is not possible to deny the part played by the personal factor which very frequently complicates the clinical picture of an occupational disease. Moreover, Lewin has for long urged that there does not exist any diseased condition due to an industrial poison the symptology of which is not identical, or almost so, to diseases due to numerous other causes. It is for the experienced medical man to ascertain within the limit of human possibility the occupational origin of the disease. The task is moreover by no means easy, for contrary to the current opinion of the layman the resources of medicine in the matter of diagnosis are by no means inexhaustible. Even after the most careful examination it is not always possible to specify with certitude the cause, origin and evolution of the pathological disorder. Is it necessary to insist on the fact that the human system and its internal reactions still hold many secrets, that scientists are still appalled by its tremendous complexity which at times causes them unblushingly to confess their ignorance? Doubtless an experienced medical man may in many cases establish the origin and nature of the disease which he encounters with a sufficient degree of certitude, yet whilst he can readily diagnose cases of neuritis, bronchitis and paralysis he may nevertheless be confronted with cases in which the occupational origin of the trouble is not obvious or is even highly uncertain.

Again, how many symptoms known to the medical practitioner as the manifestation of a definite pathological lesion may find their etiological explanation in new products or processes or in intermediary products encountered in the course

of preparation of toxic substances or even harmless substances ? What is new in such a case is not the symptom of the occupational disease but the hitherto unknown cause. Again the concomitant action of several products or any one of these products under special working conditions may give rise to a complex symptomatology difficult to analyse as to its origin and its pathogenesis. Is it necessary to emphasise the fact that occupational diseases do not constitute clinical pictures finding their explanation exclusively in new physio-pathological theories, but constitute most frequently a simple group of symptoms peculiar to certain diseases known at times as pathognomonic, the special feature of the said group of symptoms consisting exclusively in the cause which has given rise to the disease? A medical man aware of, and able to distinguish, the various forms of skin trouble — eczema, erythema — may happen to ignore just which of these may be caused by handling of certain exotic woods or by products utilised industrially. Similarly, a doctor well acquainted with aplastic anæmia or jaundice and their physio-pathology may yet be unaware that they form the principal symptoms, the one of poisoning by radio-active substances and the other by tetra-chlorethane. It is not always easy to make technical specialists and laymen comprehend accurately the conception of the relativity of disease phenomena, which do not possess immutably fixed outlines founded on an inviolable basis. How many times does it not happen that the disease originating in the work engaged in, or in working surroundings, or again in lack of skill of the individual as regards his occupation, develops, it is true, according to pathological, clinical laws, but modified as to its manifestations by the influence of other factors to be regarded as extra- or para-occupational ? It is for this reason that the important and complex problems raised by occupational disease require that medical men and hygiene experts should be freed from cramping conceptions or a vaguely delimited clinical picture likely to lead to inequitable results. In medicine, even more than elsewhere, nothing may be regarded as absolute, and it would be difficult to assign rigid delimitation to biological phenomena at the root of the diseases under consideration.

DISTINGUISHING FEATURES OF OCCUPATIONAL DISEASES

There are, furthermore, to be considered in the field of occupational disease, the clinical conception and the legal conception. Obviously, any disease form may become as a result of its origin, its mode of occurrence and its connection with work an occupational accident or disease. Thenceforward, its interest from the point of view of compensation is related more closely to its legal aspect than to its clinical aspect, which latter naturally must be completed by the former. In assessing the damage caused by work to the health, the very essence of the pathological process therefore becomes a matter of secondary consideration and the chief focus of interest is concerned with the manner of its occurrence or outbreak.

The expert must never lose sight of the fact that the diagnosis which he is called upon to make is above all medico-legal, or in other words, that he is asked to give a medical opinion having in view at the same time the definition of its legal aspect (Biondi).

Nevertheless, to establish this is often a matter of great difficulty. A medical man may, in effect, be in a position to conclude that the harmful agent by its multiple and repeated action in the course of normal industrial activity has been capable of bringing about the injury in question. But in the majority of cases he will not be able to specify that the injury definitely originated from the harmful agent in question nor whether the latter has exercised its effect at a more or less distant period of time.

Whilst awaiting an ideal solution of the problem, it is essential to discover a differential criterion providing distinction between the conception of an industrial accident and an occupational disease. From the strictly medical point of view it would neither be advisable nor necessary to arrive at such a differentiation, since from the point of view of medical science the difference presented by these two phenomena is none other than a twofold aspect of the general conception of disease (Weyl, 1908). This idea having invaded the domain of insurance has led several experts to conclude that it is likewise unnecessary in this field to separate the two branches of insurance, since it is not the cause but the effect which is of supreme interest, that is to say, the existence of temporary or permanent incapacity.

More recently Loriga, reverting to this idea, has stated : " The distinction drawn in various legal measures between accident, disease and invalidity corresponds neither to any abstract conception nor to any practical needs. The two types of risk which seem the most distinct from one another from the legal point of view, namely, accident and disease, must be considered from the health point of view as morbid occurrences and phenomena involving temporary or permanent incapacity for work which it is necessary to avoid and eliminate, and the effects of which must be combated. Benefits in kind, the object of which is compensation of the consequences either of an accident or disease, likewise do not differ from each other, at least in their essential character; they only vary as to detail."

In regard to the problem under consideration here, it is nevertheless possible to establish between these two conceptions (accident and disease) differential criteria represented chiefly by such aspects as " concentration ", " manner of action " of the harmful agent and " chronology " of occurrence in course of work. According to Borri, in the case of an accident cause may be said to be concentrated, whilst in the case of occupational disease this is described as dispersed in time (*dilué*) with the result that : (a) Where injury to health is a consequence of a fortuitous cause (sudden, concentrated) calling into existence a state of cause and effect liable to give rise to a diseased condition, the occurrence may be termed an accident ; (b) where the injury to health is of slow development and the causative factors are connected with the special nature of the industry, the condition in question may be described as an occupational disease. In consequence, certain occupational diseases of acute nature, especially infections (anthrax, etc.), should be classified as accidents.

Were it possible to draw up a table showing the various criteria (Lefort, Peri) distinguishing the two conceptions they might be represented in the following manner, recognising fully that the formulae here adopted are not exactly representative of the different principles laid down by experts :

*Origin and
nature*

An occupational disease is the consequence of ordinary work, of the repeated influence of a mechanical, physical or chemical cause, etc. to be reckoned with as a consequence of the particular trade or conditions under which it is conducted. It is inevitable to the extent that it is the outcome of repetition of the same work, it is the

result not of a single occurrence but of a cause exerted in an imperceptible and continuous fashion.

An industrial accident is an injury caused by an unforeseen occurrence (in spite of all precaution) which is sudden (as to its occurrence) and arising out of and in course of occupation. The risk is one which is known but the occurrence of which is abnormal and may be suddenly produced by an exterior cause, the immediate or almost immediate effects of which cannot be contested..

Working conditions.

As regards occupational disease, working conditions are responsible for its incidence in any particular industrial surroundings, for its development along abnormal lines, for its gravity, for the type of symptoms which characterise it, or for the aggravation of a common disease.

Accidents are difficult to foresee under certain conditions of time, place and cause. Under other conditions there is no such inherent difficulty.

Pathogenesis.

In the case of occupational disease, inception is usually slow, insidious and difficult to determine.

In the case of accident, its occurrence in point of time can be accurately determined.

Evolution.

An occupational disease becomes slowly worse, and may remain unsuspected up to the occurrence of phenomena which at times appear suddenly.

Personal factor.

The pathological cause does not give rise to any great injury in certain persons. On others, on the contrary, it may cause very serious injury.

In the case of an accident, the personal factor is also of importance as a factor in the evolution of the injury, sequelae and complications.

Death.

In the case of occupational disease death results from a series of occurrences which by repetition tend more and more to produce this result, as each weakens the power of resistance of the body with the result that each fresh occurrence is of increasing gravity.

In the case of an accident, death is usually the result of a single occurrence or its sequelae or complications..

PRINCIPLES OF LEGISLATION IN FORCE IN REGARD TO COMPENSATION FOR OCCUPATIONAL DISEASES

Reference has already been made to the special system adopted under certain legislation (France, Italy, for example) with regard to compensation for occupational diseases occurring amongst certain classes of workers (seamen, workers in tunnels, etc.) or amongst employees in public works (railwaymen, firemen, arsenal workers, workers in military establishments, etc.). The principle of right to compensation was thus already an accepted fact. Legislative authorities in various countries, faced with the problem of applying it on a much vaster scale, had recourse to various methods which may be classified under three headings :

- (a) That of admitting that all diseases may be of occupational origin, and of bringing them indiscriminately within the framework of a general sickness and invalidity insurance scheme ;
- (b) That of admitting that occupational diseases are to be regarded as an occupational risk similar to the accident risk, and of compensating them in accordance with the general principle of the national legislation for industrial accidents;
- (c) That of admitting that occupational diseases constitute an occupational risk *sui generis*, and of providing compensation for these by means of special legislation.

(a) Compensation within the general system of sickness and invalidity insurance—reference to this system is merely made for the purpose of recalling its existence, for henceforth it is only met with very exceptionally, and even then, merely in texts awaiting amendment or consolidation.

It is obvious that the system in question has the merit of providing compensation for cases of disease in regard to which it is difficult to prove the rôle of the occupational factor though at times it may be possible to establish to what extent such factor has favoured outbreak of the disease : this is so in the somewhat vague so-called “ border diseases ” which in practice represent a highly important source of lost time and form an almost fatal starting point for occupational diseases properly so called. Compensation within the scheme of sickness insurance covers a larger number of workers and evades the obstacle constituted by the delicate task of etiological diagnosis, research in complex cases into the past medical history of the worker, his heredity and his manner of living, etc., and, finally, overcomes the difficulty involved in assigning responsibility to several employers. This system is, however, open to serious objections.

First of all it imposes on all industries the burden of compensating a risk peculiar only to a few of them or at least more prevalent in certain of them. Further, it requires financial subsidy from the State, as well as from the workers, resulting in making the victim contribute to compensation for risk inherent in industry. Besides this, it accords similar benefits to those granted in the case of ordinary disease notwithstanding the fact that disease of occupational origin merits the payment

of compensation on an even higher scale than that provided in the case of accidents for legal, medical, as well as human motives. Finally, objection may also be made on the grounds of the wide difference in benefit paid for cases of incapacity in accordance with the period covered by sickness insurance. It should be noted too that the amount of benefit for incapacity is in proportion to the contributions paid, but workers in unhealthy trades are, as is well known, affected by incapacity and obliged to abandon their calling often at a very early age at which contributions paid would merely provide a very poor benefit.

Finally, despite the fact that increasing interest is being taken in the organisation of centres for diagnosis and prevention, sickness and invalidity insurance schemes have no legal obligations to conduct research as to the cause of sickness or death, neither are they concerned with causes of occupational origin more than any other, since occupational risk in an industry does not involve any change in the rate of contribution.

It is with a view to avoiding certain of these disadvantages while maintaining the advantages that certain authorities had suggested a compensation scheme within the sickness insurance system but having special provisions in favour of workers in unhealthy trades. The idea consisted in allocating expenses for compensation to certain industrial groups, selected on the basis of similar risk, the amount of the excess premium payable by these to be collected in accordance with the degree of the health risk involved in the establishment in question. It would in this way be found possible to ensure a higher benefit to the victim than that provided by ordinary sickness insurance and at the same time to stimulate employers to improve working conditions by the desire to have their establishments classified in a lower category as regard risk, hence reducing their premium.

(b) Compensation of occupational diseases within the system of accident insurance is the system adopted in the majority of countries. In order to overcome the obstacle represented by the definition of occupational diseases recourse was had to modifying the definition given of accidents; or a certain number of diseases or of causes of diseases enumerated in a schedule were assimilated to accidents for the purposes of compensation.

In practice, the first solution was achieved by the defining of industrial accidents in such a way as to cover in a larger measure occupational diseases, a number of which, however, tended to become excluded by the application of a formula not sufficiently comprehensive. For this reason certain legislative authorities (New South Wales, United States, etc.) considered they had found the solution by replacing the word "accident" in the definition by the word "injury". Judging by results obtained in practice over an already lengthy period (ten years in California) there is a temptation to recognise that the method presents considerable advantages, more especially if the necessary precautions are taken to avoid any abuse to which the system might give rise. Though perhaps longer experience would be desirable, before passing judgment it must be stated that the experiment is one to be followed with the closest attention.

The second solution was found in the drafting of a schedule which, up to the present time, has assumed at least three different forms.

The first consists in a list of diseases or injuries met with amongst certain workers who may fall victims to these without any allusion to the clinical picture nor to the various processes. The schedule drafted on this principle comprises two columns: the first containing enumeration of the diseases or injuries (for instance, "poisoning by lead and its direct sequelae") or "poisoning by mercury and its direct sequelae", ankylostomiasis, anthrax, etc., and the second specifies in regard to each disease that compensation is granted for injuries affecting all workers engaged in "any process involving the manufacture or use of lead, its compounds or alloys", "of mercury, its amalgams or compounds", etc. This type of schedule is met particularly in English-speaking countries. It implies presumption of occupational origin in favour of the worker, in each case in which the conditions outlined in the schedule are fulfilled. Nevertheless, where the diseases or injuries are found inscribed in the first column without the occupation or the process in question being indicated in the second column, the onus of proof of occupational origin of the disease or injury rests with the worker.

Under this system of compensating occupational diseases within an insurance scheme for industrial accidents, extension of the list of occupational diseases can only cover cases occurring in occupations subject to accident insurance. The Act or the schedule should therefore specify the field of application by indicating those industries to be comprised or excluded.

The second formula provides a schedule of which the first column contains enumeration of the diseases to be compensated with their "clinical symptoms"; for instance, lead poisoning, paralysis, rheumatism, colic, cachexia, etc.; and the second specifies for each disease the industries or processes likely to give rise to the symptoms in question, for instance, as regards lead poisoning when the disease

symptoms enumerated are met with in workers engaged in "the metal industry, refining of lead, tinning, manufacture of lead salts, of pottery," etc. Similarly, there is mentioned after "poisoning by mercury, stomatitis, trembling, paralysis", etc., and in the list of processes: "distillation of mercury, gilding and silvering by mercury, the manufacture of salts of mercury, etc." Consequently, any disease affecting a worker engaged in any of the processes enumerated in the second column which manifests symptoms not comprised in the first column of the schedule or any clinical syndrome mentioned in the schedule in a worker engaged in an industry not described in the second column precludes right to compensation.

The international schedule of 1925 contains features of both these methods being in accordance with the first as regards diseases to be compensated, and the second as regards enumeration of the industries or processes covered.

The third method is that followed under certain legislation, for instance, in Switzerland and Finland, which confines compensation to injuries caused by one of the substances mentioned in a schedule.

Whichever of these measures is adopted one of the chief criticisms formulated against the schedule system is that which raises objection to its rigid form demanding periodical revision in order that its contents should correspond to reality. It is true that the schedule has the advantage of constituting a useful guide for the doctor, the employer or the worker, who is thus made acquainted with the province of the occupational risk. Yet practice has proved that the schedule does not always come up to expectations; that the Government service finds itself in the necessity of issuing multiple instructions and commentaries to the Act or regulations, in order to ensure early diagnosis of occupational diseases being effected by medical men and at the same time adequate prophylactic measures being adopted by employers.

On the other hand, insurance institutions, convinced of the advantages of propaganda of this type in regard to prevention, not infrequently exceed the benefits provided by legislation and are inclined to adopt a very generous policy in according to victims the benefit of "voluntary" insurance for certain diseases not comprised in the schedule, the occupational character of which is, however, obvious; Switzerland, for instance (National Accident Insurance Fund).

(c) The third method of compensation by means of special legislation is that adopted in Belgium, for instance, in regard to occupational diseases in general, and in Great Britain for silicosis in certain industries. The special features of these methods are explained later (see below, Second Part, pp. 57 et seq.).

SCOPE OF COMPENSATION LEGISLATION FOR OCCUPATIONAL DISEASES

It is not perhaps without interest to give a somewhat brief review of the framework of an Act dealing with compensation for occupational diseases. An outline of this kind will make for a better understanding of the various national laws of which a short summary is given later.

Whilst the field of application ought theoretically to cover extension of compulsory compensation to all individuals exposed to a given occupational risk, it happens that in practice the systems adopted often restrict even considerably this extension.

Where occupational diseases are compensated by extending accident insurance, it is the workers covered by the latter who benefit under the new legislation. Where this is not so, a schedule or administrative regulations may mention expressly special industries and categories of workers covered.

Obviously in industry, which is complex from the technical point of view, only one or certain departments may involve exposure to the risk in question. However that may be, it is essential that the relation between the process and the industry in question should always be clearly defined.

Often compensation legislation covers other branches of activity such as agriculture, sea or land transport, as well as new undertakings such, for instance, as health and hygiene services, social or rescue work, etc.

Beneficiaries under the legislation are naturally those workers engaged in processes coming within the Act, when attacked by a disease which, within the meaning of the Act, may be regarded as occupational. In general, all provisions relative to accident insurance are valid as far as they are applicable, and unless special regulations to the contrary have been issued, in regard to occupational diseases. Here again, the relation between the worker (victim) and his occupation as covered by the law must be clearly defined.

It often occurs that apprentices, even those not receiving remuneration, salaried employees as well as workers, who though not engaged on the process covered by the Act, nevertheless work in the same factory or in the same workroom and hence incur the same risks as the injured worker, are also covered by the provisions affording compensation.

As regards employees, legislation may exclude those whose salaries exceed a certain figure.

The *risk* is fairly clearly defined, consisting as it does of a disease or injury occurring under conditions which are sufficiently well known. The injury in question is the result of a given occupation, which further affects with special gravity and special incidence, which in most cases is readily proved, categories of workers in a given undertaking. It is true that the worker, by reason of the life he leads or lack of hygienic precautions, may increase the incidence of the risk in question but, as has been seen, insurance schemes based on the existence of occupational risk do not take account of such injury unless attributable to intentional or serious negligence amounting to fraud.

MEDICAL CO-OPERATION IN INSURANCE

One of the tasks imposed on the medical profession at the present time by social legislation is that of compulsory *notification* of occupational diseases. Compulsion in regard to this matter is the logical outcome of the fact, henceforth beyond discussion, that rational and effective organisation of prophylaxis can only be based on exact knowledge of occupational risks.

Further, the Committee on Unhealthy Trades at the First International Labour Conference (Washington, 1919) in a resolution which was adopted by the Conference expressed the hope that "all cases of occupational disease will be notified by the physician".

In practice, notification covers first of all those diseases inscribed in the schedule or enumerated in the Act. The employer, the victim or his dependants are obliged to make notification to certain competent authorities or institutions, or it may be a third person is designated for this purpose, and in most cases the person in question is the medical man in charge of the case. Certain legislative provisions exempt from this obligation the factory surgeon or the medical man entrusted with the periodical examination of the workers. Other systems support the view that the duty of notification by the medical practitioner does not relieve the employer of responsibility in this connection. Generally, notification must also be made in regard to suspected cases.

In certain countries, notification covers further certain occupational diseases not inscribed in the schedule, but knowledge in regard to which is indispensable with a view to future measures of prevention or compensation.

Generally, legislation requires that notification should be made on a special form, sent post free, and supplied by the competent Government service to those required to use it. Obviously it is in reality the victim who ought to take the first steps, since he alone is aware of the injury caused to his health. It is the victim who is required to make notification to his employer, inscribing his name, Christian name, address, the medical diagnosis, the nature of the industry and process in which he was engaged, the name and address of the industrial establishment. This notification is transmitted by the employer to the insurance carrier and to the factory inspectorate, which in some cases is however only informed later by the insurance authorities. The legal provisions lay down a certain delay for the receipt of the notification, which ought to be slightly longer than in the case of an accident.

Under many legislative systems the accident insurance scheme leaves the victim free choice as to his medical man, but in general most schemes do not make the employer responsible for supplying medical treatment beyond the rendering of first aid. In practice, however, numerous industrial undertakings have organised first-aid services at the factory, and even possess hospitals fitted out in accordance with the latest surgical requirements.

Though in regard to common diseases, freedom in the choice of a doctor may be thoroughly justifiable from the psychological and practical points of view, this is not the case as regards accidents and occupational diseases. The special knowledge required in regard to these, the long experience necessary in regard to detection and diagnosis, not to speak of the special treatment required, and above all the necessity for expert opinion in assessing injury, can only be obtained by engaging a specially trained medical man. It should be noted here that adequate instruction in regard to industrial accidents and diseases or technical organisation of hospitals or health services in this sphere is not always available to the ordinary medical practitioner (see later).

The requirement of compulsory treatment for the victim found in certain legislative provisions corresponds to special

medical organisation as above referred to. It is true that the disease is always the same, no matter what the cause or the manner of its occurrence. But the same medical findings may lead to different legal conclusions (*ideum medicum, diversum juridicum*) whence the great importance of the medical certificate — the basis of all compensation procedure — provided by the medical man who was the first to examine the victim of the accident or occupational disease.

Medical practitioners receive a special form, drawn up by the insurance carrier, on which they are required to inscribe the etiological diagnosis made, with attention of course to the legal measures under which the certificate is issued.

The doctor must enumerate the symptoms which he believes to be due to occupational disease. At times he is free to mention likewise those which, in his opinion, may be of importance from the point of view of diagnosis, though apparently they are not of occupational origin. Finally, he must indicate the probable course of the disease or injury met with.

In many countries, compulsion relative to notification or the provision of a certificate has given rise to much criticism from the point of view of professional secrecy. Obviously, the medical man has no right to communicate the results of the medical examination to anyone whosoever. Yet this obligation should not prevent him from accomplishing the task imposed upon him by the law, the object of which is, amongst others, economic compensation for the injury caused. It is possible to guard professional secrecy even while permitting the medical man to comply with the legal prescriptions (see later).

It is hardly necessary to insist on the importance of the rôle of the medical man in social insurance, and particularly in occupational accident and disease insurance. Yet it seems advisable to stress especially the importance of medical intervention in regard to the observation of clinical disease symptoms attributed by the victim to his occupation. Etiological diagnosis is difficult, at times impossible. It is the task of the medical man to observe attentively and scrupulously all objective phenomena presented by the patient, and to bring these into relation, by means of accurate and critical judgment, with the alleged subjective troubles. Such observations and analyses are highly important, and should be effected in the absence of all preconceived ideas and with great care to refrain from adding to

or subtracting from, or modifying in any way, the phenomena observed in order to make diagnosis conform to some pre-conceived idea. The doctor should finally take an active part in investigation as to the nature of the process effected by the work, the products handled, and the special working conditions under which the patient has performed his work, and should have recourse to all methods of clinical, hygienic, or where necessary, chemical research, with a view to assembling all data required by him.

The *sequelae* of diseases contained in the schedule likewise represent an aspect of the question in regard to which the medical man is called upon to act in the full measure of his competence.

Moreover, even legislative authorities are not agreed as to the formulae for inscription in the schedule in regard thereto, for at times there is found : "poisoning by ... and its direct sequelae," and at other times the word "consequences", without any further qualification ; or again, the symptoms are enumerated which are considered as the sequelae of the poisoning (France, Italy). On the other hand, other legislative provisions refrain from any exact inscription, considering that the disease caused by the chemical, physical or biological agent mentioned in the schedule is due to one of these agents, provided that its relation to the work engaged in by the victim can be proved (Germany).

Assessment of *incapacity* for work is another difficult task entrusted to the medical man. Countless questions are put to him which demand not only first-rate physio-pathological knowledge, but in addition very delicate clinical and psychological judgment. It is perhaps advisable to mention here the fact that German legislation distinguishes essentially between the diseased condition in the medical sense (*Erkrankung*) and an abnormal condition, either pathological, physical or psychic (*Krankheit*), requiring recourse to sickness insurance (medical, pharmaceutical treatment, etc.), and which may result in immediate or later reduction, or even elimination of earning capacity.

Previous to the occurrence of this condition, there does not exist within the sense of the Act a disease due to the absorption by the body, for instance, of lead or mercury. It is therefore the doctor alone who must decide, for instance, whether or

not it is opportune to dismiss a worker "in imminent danger of poisoning", with a view to avoiding certain occurrence of more serious injury by certifying that, even in the absence of actual working incapacity on the part of the victim, the measures proposed are in the interests both of the patient and the insurance carrier.

Very often a symptom of sudden occurrence (typically: lead colic) is merely the epiphenomenon of poisoning of silent development. In this case, the doctor must decide whether to report temporary incapacity due to an acute symptom, or rather to make the more serious diagnosis of chronic poisoning. The fundamental criterion will always be the degree of working incapacity, the determination of which is an essentially medico-legal point having for its particular object the definition of a legal aspect.

The doctor should therefore utilise the elements placed at his disposal by his knowledge of physio-pathology and the clinical symptoms, in distinguishing between the sick worker and the disabled worker with loss of earning capacity.

In fatal cases, it is always essential to carry out an autopsy, not only with a view to furnishing positive arguments in regard to the decision to be taken, but also from the point of view of the progress of medical science.

Finally, while the doctor is called upon to solve very difficult problems, it is essential that excessively strict criteria — such as those proposed in certain countries — should not be imposed on him, even admitting that for the moment sufficient practice is lacking in regard to decisive judgment on certain points.

Though filling in of the certificate may be entrusted to the medical practitioner, general control of cases notified must be in the hands of an expert in industrial medicine, whether he is an official of the medical inspectorate or attached to the insurance institution. Practice has shown that the number of cases of occupational diseases notified is often very high in proportion to the number compensated. A doctor must obviously have a special training in order to enable him to discover cause and effect in cases of occupational origin, which is the essential aim of medical examination and of control of the occurrence of cases, and to estimate accurately the part played by various circumstances, the first medical certificate provided being, until proof to the contrary is obtained, the

only document supplying information as to cause and effect, and thence entitling the claimant to compensation. In Germany, for instance, it is the medical specialist attached to the insurance institution who is entrusted with the task of immediately affirming the state of health of the worker notified as sick, and it is his examination which furnishes the insurance fund with the necessary data for subsequent decisions. The doctor entrusted with inspection must also direct his attention to doubtful cases, and do everything in his power to throw light on these. In Italy, choice of a medical expert is limited to specialists particularly competent in regard to industrial medicine (lecturers on the subject). The doctor, whilst being a good clinical specialist, must also be trained in technical matters and aware of the conditions under which industrial work in general, and work in unhealthy trades in particular, is carried out. The task is not always a simple one, and the habitual obstacles encountered are further increased by the fact that the medical man is often called upon to give a decision under circumstances of widely divergent views held by the experts in question.

It is therefore desirable that during their University career — or better still, by means of post-graduate courses periodically organised in industrial centres — doctors going in for this special branch of medicine should have the opportunity of completing their medical training. Repetition of such courses is necessary with a view to keeping those concerned abreast of progress and of the continuous transformation going on in industry, knowledge of which is essential to ensure correct diagnosis.

Amongst the most complex problems which the industrial doctor is called upon to study, there may merely be mentioned those of past medical history and of infections.

In many cases, it is not possible to accuse the worker who affirms freedom from serious disease in the past of withholding information. How many times, for instance, have even intelligent persons suffered from syphilis without being aware of it, and in how many cases has medical examination proved indecisive, a negative reaction not always sufficing for the exclusion of the existence of a suspected but unproven disease?

Assessment of the part played by the *past medical history* in cases of occupational disease encounters serious obstacles.

The degree of individual reaction to the same harmful agent is highly variable, as is likewise the rate of reaction of the body — apart from the dose of poison — it being more usually related to the physico-chemical properties of the substance or to its mode of entry into the system. To this must be added individual anatomical peculiarities, the soundness of the organs of elimination, diatheses, auto-intoxication (alcoholism), in short, the rôle of all the phenomena now characterised as allergic, whether it be a question of anaphylaxis or acquired or primary hyper-sensibility.

For a long time back, in fact since the introduction of the first Workmen's Compensation Acts, experts on the subject have engaged in discussions as to the value to be attributed to past medical history¹ in assessing working incapacity. Already in 1907, the Twentieth Congress of the French Surgical Association passed a motion to the effect that "the Act of 1898 should be amended so as not to exclude, without due consideration, in pecuniary compensation of accidents, the part played by pre-disposition and pre-existing disease".

Clinically, no injury can be said to be free from this influence. From the medico-legal point of view, injury due to an occupational disease or an accident may be modified or aggravated by pre-existing disease, or disease engrafted thereon (referred to in French as "*conours de lésions*" — concurrent injury) or again, the injury in question leading to incapacity may affect an individual already suffering from another health handicap without, however, the pre-existing state having any influence over the progress of the new injury ("*conours d'invalidité*" — concurrent disablement).

The Swiss Act (section 91) already provides for this aspect of the question by declaring: "Compensation benefits in money shall be subject to a proportional reduction where the disease, incapacity or death, are only partly to be attributed to the effects of an accident covered by insurance". According to Pometta it is not only the past medical history which is intended by the article in question, but any circumstance (the occurrence of any factor of ill-health) which exerts an unfavourable action on the development of the injury resulting from the accident, no matter at what stage such action occurred. Nevertheless, this authority adds that slight pre-disposition to a disease should not be considered as a previous condition of ill-health justifying in itself reduction of benefit. The previous state of health must in this case constitute a real pathological condition or a special morbid habitus, and it cannot be taken into consideration when it was the cause of the accident or the disease but has not aggravated the consequences thereof.

According to Molineux, any disease or infirmity which has indubitably involved diminution of earning capacity or aggravated the sequelae of the disease ought to be taken into account as regards

¹ This question has been made the subject of an international competition instituted by the Organising Committee of the Fifth International Congress on Occupational Diseases and Industrial Accidents (Geneva, 1931), the prize to be awarded in 1935.

reduction of benefit. Other German authorities consider that where a pre-existing disease of a non-occupational character has been unfavourably influenced in its development by an occupational disease engrafted thereon, it should be considered as an essential consequence of the latter. Similarly, diseases favoured in their outbreak or their progress by the unhealthy constitution of the individual affected are to be considered as occupational diseases where they are essentially due to the work engaged in.

It is true that assessment of past medical history with a view to eventual reduction of benefits presents more difficulty than in the case of accidents, since the state of health in question frequently plays in regard to disease a rôle which it is at times impossible to specify. Moreover, numerous authorities consider that it is difficult to determine exactly the effect of such a condition on the progress of an accident, and still more so on that of an occupational disease. Further, it should not be forgotten that tubercular workers, or those suffering from nephritis, diabetes or another disease, at a latent stage, who enjoy, in short, apparently sound health, are at any rate in a position to earn an adequate living up to the moment at which the accident or the disease occurs to accelerate the development of the pre-existing morbid condition, or even bring about death. Would there in such case be justification for withholding compensation for injury actually caused to the individual or to his dependants when the latent disease which might not have become malignant has been so aggravated by the accident as to diminish or even entirely suppress the earning capacity of the worker or to cut short his life ? Is it not necessary to recall the fact that the accident or disease in question has not merely diminished or even suppressed the earning capacity of a normally healthy individual, but what working capacity the victim possessed at the time of the occurrence ? It might further be added that a less fit worker earns in general a lower wage in keeping with his working capacity, and since the payment of benefit is based on agreement and is paid in a lump sum, efforts should be made to avoid aggravating a situation already prejudicial to the worker.

This question is connected with that of employment of delicate or aged workers. It will be recalled that in various countries, during discussions of Bills on workmen's compensation, it had been alleged that once such legislation came into force it would exercise an unfavourable effect on married workers

with children dependent on them, since employers would certainly prefer to employ bachelors. Practice has proved this apprehension to be ill-founded. A similar apprehension expressed to-day relative to exclusion of the sick, the delicate or the aged is likewise without foundation, since compulsory insurance cancels the advantage of removal of the more susceptible in the case of occupational risk. Even legal decisions in certain countries have failed to support the theory of excluding workers not enjoying normal health from ordinary work, by making appeal to the fact that the overhead industrial charges would thereby be inclined to become burdensome and interfere with the general well-being and prosperity of a country. The previous state of health should in no wise influence estimation of the benefits to be paid in compensation for injury caused to a worker, since the accident in question is the result of occupation and not of the disease from which he suffers.

Another much-discussed problem is that of acute infection, apart from diseases forming the borderline between accidents and occupational diseases (caisson disease, suppurating callosities, etc.), which according to legal awards has at times been considered as an accident and at times as an occupational disease. Contrary to certain legislative measures, the majority of authorities henceforth, with the support of legal opinion, are in agreement that it is not necessary that the entrance of the pathogenic agent should be the direct consequence of an accidental wound received while at work in order that the acute infectious disease due to inoculation at the surface of the skin should be recognised as an accident. In fact, even if the slight abrasion does not occur during work, the legal aspect of the question still exists, provided that the relation of cause and effect can be proved.

The occupation, the material handled, special working conditions, suffice in proof of presumption of the penetration of the pathogenic germ already existing in the working surroundings (anthrax spores from handling of hides, skins and hair ; tetanus spores from stables, gardens, etc. ; ankylostomiasis larvae from mines, tunnels, etc.). Opinion has been expressed that acute infectious disease should be regarded as an accident ; a principle which has received the sanction of legal decisions under which such occurrences have for long enjoyed the benefits of compensation by means of the extension of the definition of accidents.

Even for infectious diseases of sub-acute development (glanders, actinomycosis, foot-and-mouth disease, etc.) it suffices to prove that the harmful agents have acted on the body in such an intensive fashion that its action may be described as having occurred within a fairly restricted time limit. On the other hand, certain legislative authorities have preferred to inscribe such diseases in the list of occupational diseases (Germany, Great Britain, etc.).

Malaria has for long been an object of discussion, despite the fact that in each instance in which employment constitutes a *specific* element of risk as compared with *generic* risk to which the whole population is exposed, malaria has been considered as an accident¹.

When entering an unhealthy trade, a worker should be medically examined, and should undergo subsequent examination at regular intervals² during his employment in the factory. The object in view is to protect as far as possible healthy workers entering the trade from harmful effects of occupational origin, and to safeguard the industrial community engaged in certain industries (underground workshops, coal mines, public transport), as, for example, by refusal to accept individuals who are carriers of ankylostomiasis, or by dismissal of chauffeurs and engine-drivers suffering from a disease (epilepsy, tabes, progressive paralysis, daltonism) which represents a source of danger both for the worker and for the public.

Medical examination in the factory implies the keeping of *health records*, the form of which is generally fixed by the competent Government inspection service. Certain objections raised against the use of records or of individual cards by the medical factory service have ceased to be of much account. This method, which is to-day extensively applied, has not been found to give rise to serious difficulty or trouble as regards professional secrecy. In this connection it may be recalled that reports are usually written in an abbreviated style or in accordance with conventional formulae known only to those who, in accordance with the law, have right of access to them.

¹ This view has, for instance, been taken in making a recent (1933) legal award in Italy, which treated as an accident a case of malaria affecting a healthy worker from a malaria-free area who was sent to work in a malaria-infected district.

² Cf. p. 56.

INSURANCE BENEFITS

Insurance affords compensation for total *temporary* incapacity, and total or partial *permanent* incapacity and for death. Where special sickness insurance exists, benefits are granted for all temporary total incapacity unless special measures issued with regard to occupational diseases contain provisions of a contrary nature.

The *date* of the disease is that on which the need for medical or pharmaceutical treatment has been objectively recognised to occur, and of the actual reduction or suppression of earning capacity. In practice, it is the date of the medical certificate delivered at the first medical examination or that of suspension from work.

Certain legislative measures exclude from benefit all cases of *temporary* incapacity under ten days (Italy), or fifteen days (Belgium) with a view to eliminating diseases which are hard to define or those of very short duration, from becoming the subject of difficult etiological diagnosis, it being possible for the worker himself or for a mutual sickness insurance scheme to defray expenses in such cases. This system is also said to possess the advantage of preventing malingering or exaggeration of indisposition of slight importance. For reasons which will be readily understood, certain legislative measures provide that even in cases of total temporary incapacity exceeding in duration the waiting period, benefits are only due after the expiry of a fixed delay.

In the case of total or partial *permanent* incapacity, the victim (or his dependants in the case of death) receives a lump sum or an allowance in the form and under conditions provided in the case of accident or by special legislation.

It should be recalled here that certain legislative measures have raised the degree of permanent incapacity excluded from compensation. In Italy, for instance, the law does not afford benefits for permanent incapacity due to accidents inferior to 5 per cent., a limit which in the case of an accident in agriculture has been raised to 15, and to 20 per cent. for occupational diseases, the explanation in such cases being based on the greater difficulty of assessing permanent incapacity in regard to an occupational disease than in regard to an accident.

In general, measures for the payment of compensation in regard to occupational diseases are similar to those issued governing accidents, unless special legislative measures have been issued imposing other conditions (see below, Second Part, pp. 57 et seq.).

Intimately connected with these problems are those of allocation of benefit in the form of an allowance — which is becoming more and more general — and of periodical revision of benefits.

Whilst incapacity may at times be considered in regard to the particular work engaged in (specific work), the degree of incapacity of the victim is usually only calculated on the basis of incapacity for work in general. This problem has been much discussed, since this interpretation according to many authorities leads to an unjust reduction of the benefit.

Under certain legislation, the right to compensation for occupational diseases is not recognised unless the worker has, at a given time during the twelve months preceding the date of the outbreak of the disease, worked in an industry involving exposure to the risks of the disease which he has contracted.

Similarly, certain legislative authorities (French, Italian, etc.) have laid down for each disease inscribed in the schedule a certain delay governing liability. Obviously, provision must be made for compensating workers who, having abandoned working in an unhealthy trade, may subsequently fall a victim to disease while following another employment. The limits of liability are fixed in this case at one year for cases of poisoning by lead, mercury, benzine, and phosphorus (Italy, two years); at six months for ankylostomiasis (Italy). It might, however, be asked if the time limit fixed is not unduly short in certain cases, and if it is not preferable to follow the example of the authorities in Belgium who have fixed a general limit of three years. It is essential that in the case of diseases well known to have a long period of latency (silicosis, tumours), the time limit should be given serious consideration.

More recent legislative measures, for example the Italian regulations, make provision for the victim of an industrial disease to receive the attention and *treatment* considered necessary by the insurance authorities, and where necessary to receive hospital or clinical treatment indicated by the insurance carrier. Expenses of medical and hospital treatment are under these circumstances defrayed by the insurance carrier. Should the patient refuse without justification to undergo hospital treatment, he forfeits all right to compensation. Justification for making treatment compulsory from the social aspect cannot be denied.

In case of *death*, the right to indemnity is forfeited by the dependants if they refuse authority for carrying out an autopsy demanded by the insurance carrier for reasons admitted by the administrative authorities to be well founded.

A very important benefit, from the point of view of preventive medicine, is the granting of an indemnity to a worker suspended from work in an unhealthy trade, in accordance with the suggestion of, and certificate provided by, the medical man in charge. It is a fact that such suspension from work cannot be effected without a sacrifice, which is at times considerable (loss of a sure wage which the worker in imminent danger of disease cannot replace by means of other work). It is for this reason that the transitional allowance allocated to the worker until he has found work at a wage approximately equal to that which he has lost is of value in making up, to a certain point, the difference between the wage which he is able to earn and the average daily wage which he has sacrificed. It happens, however, in practice that workers refuse to abandon an unhealthy trade under these circumstances. This raises a problem difficult of solution, namely, whether the injury encountered after resumption of work ought to be compensated, or whether a refusal of all claim for indemnity on the part of the victim as provided for in certain legislation may be considered equitable¹.

RIGHT OF APPEAL. — TIME BAR. — REVISION

The question of the limitation of the time within which a claim for compensation must be made is a delicate one. In the case of an occupational disease which is essentially chronic, to indicate the moment (date of medical certificate, date of suspension from work) from which delay in regard to the procedure of notification should be calculated is certainly a more difficult task than in the case of an accident or even of an acute infectious disease. For this reason many authorities consider that in general the delay fixed by legislation is not sufficient, more especially in the case of slow poisoning (see above).

The victim, as well as the insurance carrier, possesses the right of appeal against decisions made and of revision in regard to rates of benefit allocated.

When benefit is paid in the form of an allowance, revision

¹ For special conditions affecting workers suffering from silicosis, see legislation p. 255.

in regard to all cases of permanent incapacity owing to occupational disease of chronic and slow development is necessary. Application for this revision may be made at any time in Germany, for instance, whilst in other countries a certain time-limit is fixed, for instance of three years in Italy, and only in the case of change occurring in the physical condition of the victim.

EMPLOYERS' LIABILITY

This aspect of the question assumes a special character as regards compensation for occupational disease, for the majority of experts are agreed in recognising that negligence and carelessness on the part of the employer are less excusable than in the case of accidents, the risk of sickness being neither unforeseen nor sudden.

Apart from cases in which the worker at the occurrence of the disease is still employed in the occupation covered by the Act or came there from a factory involving exposure to similar risk — cases which present no difficulty — the problem becomes a very different one and complications arise whenever the victim has left an unhealthy trade and accepted work in a less unhealthy trade or one of quite a different kind. Though compensation is provided on the basis of individual liability on the part of employers, it is not always easy to determine the amount of liability to be attributed to each employer where several are concerned. Moreover, it is necessary to determine also the moment at which the employer becomes liable for the injury or disease due to occupation in the worker whom he has employed. This raises the whole problem of the duration of invasion, of the latent period and of the development of the disease, which at times only becomes manifest after a fairly long period of time has elapsed since the action of the harmful agent liable to produce it took effect. Except in the case of well-known infections, medical knowledge is often far from being able to furnish indications enabling the outbreak of disease or the various circumstances capable of modifying its development to be specified with the precision and exactitude required. On this account the legislative measures referred to above, taking account of the fact that occupational disease may be contracted progressively, make provision for placing res-

possibility not only on the last employer but on all those who, in the course of the period recognised with regard to liability, have occupied the victim on work liable to cause the disease. In default of agreement the proportion of compensation to be paid by each employer is fixed by arbitration.

Difficulties are eliminated when the individual liability of the employer is replaced by collective responsibility organised on the basis of groups of industries subject to similar risk or of a single central fund. In this way opportunities for litigation are reduced to a minimum and the parties are jointly represented by a competent neutral organisation which undertakes the settling of eventual disputes.

LITIGATION

In general, disputes are submitted for settlement to the ordinary courts when occupational diseases are compensated by means of extension of the Workmen's (Accident) Compensation Act. Nevertheless, in certain cases special courts have been created (for instance in, Italy in regard to accident insurance in agriculture), a solution which obviates much disadvantage (fraudulent claims, litigation) and makes for rapid and less costly settlement of disputes. At times these courts merely accept the problems of an economic nature, but it is to be hoped that they may become organised in such a manner as to deal likewise with questions of a technical nature.

INSURANCE ORGANISATION

The *organisation* of social insurance is a matter regarding which much is still being written, and it is not necessary at this point to enter into discussion on this subject. Compensation for occupational diseases is at present provided under three forms : individual liability, individual liability with guarantees, and compulsory insurance.

The great majority of legislative authorities are now agreed in recognising the principle of occupational risk, whether they propose to deal with it by means of compulsory insurance or whether they replace this system by a scheme of guarantees alleged to be equivalent. A minority restrict action to inserting in the Act the principle of occupational risk and of compensation

by a lump sum without guaranteeing the claimant, other than by privilege, against possible bankruptcy on the part of the employer.

In practice, compulsory insurance is becoming more and more widespread and general insurance institutions are being organised to cope with all financial risk on the part of employers. Thus in France, where the law assigns individual responsibility to the employer, associations have been created guaranteeing the employers against risks under the Workmen's Compensation Acts as well as guaranteeing benefits to the workers. In Great Britain the method of a single central fund has been adopted for insurance of silicosis in certain industries and whilst for accidents neither the principle of compulsory insurance nor even that of State insurance has been enforced, nevertheless the Secretary of State has power to issue an Order, subject to later ratification by Parliament, requiring all employers in a given district and a given industry to become insured on lines laid down in the Order under a system of mutual insurance or with an insurance company grouping the majority of those affected in the said district or the said industry.

Administrative control is in general the task of the State and in particular of the competent Government service.

As in the case of accident insurance, premiums are payable by the employer under legislation based on occupational risk. Obviously, it is all to the advantage of employers to improve health conditions in their industry by introducing better working conditions, better plant and apparatus, etc., with a view to combating the risk involved as far as possible and consequently reducing their premiums. Therein consists one great advantage of the legal establishment of compensation rights. On the other hand, legislative measures make provision for exempting from payment of premiums any employer who can prove that the industrial processes engaged in in his establishment no longer involve the manipulation of toxic substances likely to cause the diseases covered. Similar exemption may be accorded when an undertaking, whilst utilising harmful materials, installs apparatus guaranteeing suppression of all risk. The employer of course remains liable under the conditions provided by the law as regards occupational diseases which may have affected workers in his employment at a date prior to notification of the introduction of healthy conditions.

STATISTICS AND THE COST OF COMPENSATION

Few statistics are available relating to the incidence of occupational disease in countries possessing legislation. Only those of two or three countries lead to any conclusions whatsoever — and even these with reservation — as to the results of experience in this matter ; and even in these special cases the data furnished, though otherwise highly interesting, are not comparable and for obvious reasons (of which it is merely necessary to recall the more important) the figures in question must be interpreted with great prudence.

To begin with, successive modifications in the schedule have the effect of extending or changing the field of application¹ : this is so in regard to silicosis, which not only covers increasingly numerous occupational categories but in regard to these affords compensation by retroactive legislation.

Another change independent of the application of the Act is in the number of persons covered. For some years past there has been a great fall in the number of employed workers, and hence of those subject to insurance. A further factor is the state of health of the working classes : during an influenza epidemic, for instance, the health of the workers is more likely to be affected by occupational disease. Other factors are connected with the assistance rendered by the medical profession and co-operation on the part of the workers themselves in regard to the administration of the law. In fact, medical men by improved comprehension of pathology and etiology, and the workers by a growing understanding of their rights, increase the number of claims for compensation. This would appear to explain, at least up to a certain point, the regular progression in the number of cases of occupational diseases notified. It is possible also that better administration of the law has its effect. Nevertheless, for about two years past there is recorded an arrest or a diminution in the number of cases notified, and this may naturally make itself felt in the number of cases compensated.

Though it is certainly possible to point to the prophylactic work represented by technical improvements, to the training of those exposed to risk, to the results of medical examination on engagement and periodically thereafter, which permits of early diagnosis of diseases — success which must be attributed to compensation legislation — there must also be taken into consideration the present economic depression, since unemployment involves exposure of a reduced number of workers to the risks in question.

It is not possible to find a satisfactory explanation of the difference between the number of cases notified and cases compensated, which is very considerable in certain countries and relatively slight in others. Perhaps it is connected with the functioning of legislation in each country.

In fact, whilst the number of cases compensated in Germany passed from 9.6 per 100 cases notified in 1928 and 9.3 in 1929 to 23.9 in 1930, 26.6 in 1931, and 26.3 in 1932, in Belgium, on the other hand, it amounted to 52.5 per 100 in 1928, 67 in 1929, 74.4 in 1930 and 65.7 in 1931, and in Switzerland to still higher figures, since the percentage was 92.3 in 1926, 88.6 in 1927 and 90.3 in 1928.

¹ Thus in Germany of the 7,514 cases compensated for the first time in 1929-1931, 5,740 or 76.39 per cent. concern occupational diseases added to the schedule in 1929.

As regards the *cost of compensation* for occupational diseases, it must be stated first that the total amount expended and the average for each case vary in accordance with the schedule in force and in accordance with rates of benefit accorded under the Act. Obviously, the cost varies also very greatly in accordance with the field of application of the Act and likewise in accordance with the industrial group concerned, facts which are demonstrated very clearly by English statistics (see below). Nevertheless, if an attempt is made to compare the incidence and cost of occupational disease to those of accidents, it is seen that the incidence and cost for the former are relatively of slight importance. It is found, in fact, that the incidence of occupational disease only attained in Germany 0.56 per cent. of that of accidents (1930) and 0.74 (1931), whilst in Great Britain the percentage was a little higher : 4 in 1929, 4.4 in 1930 and 5 in 1931. Cost represented in Germany a percentage of 2.09 of that for accidents in 1930 and 2.81 in 1931; in Great Britain, a percentage of 9.5 in 1929, 10.2 in 1930 and 11.3 in 1931 ; in Switzerland, 0.72 in 1926, 0.75 in 1927, and 0.66 in 1931. It is true that inscription of diseases in the schedule, entitling victims to compensation applied retroactively — this is the case in regard to silicosis in Germany — and especially extension of the schedule or changes made in benefits, increase the expenses involved by compensation. Proof of this is to be found in Germany and in Great Britain. In Belgium, however, it is the payment of allowances to dependants which in these last years has caused the sums expended to exceed what was foreseen.

An analysis of returns for certain countries for which statistics of this kind are available shows the following results:

Belgium

	Cases notified					Cases compensated				
	1928	1929	1930	1931	1932	1928	1929	1930	1931	1932
Lead poisoning	38	55	126	131	110	24	38 (3)	92 (7)	75 (5)	71 (3)
Mercury poisoning	—	—	2	1	—	—	—	2	1	—
Anthrax	2	11	3	5	4	2 (2)	10 (3)	2 (1)	4 (2)	4
Total cost of compensation for the year (including payments to dependants and continued payment of compensation awarded previously)										
	1928	1929	1930	1931	1932					
Lead poisoning										
Mercury poisoning	68,069.65	170,652.35	355,611.65	451,606.70	495,703.50					
Anthrax										

The figures in brackets represent fatal cases.

Czechoslovakia

Act came into force: 1 July 1932

<i>Cases of occupational disease up to 30 November 1932</i>				
	Prague			Brno
	Outbreak of the disease		Total	Total
	Previous to 1 July	After 1 July		
Notified to the Insurance Institute at Prague	546 (48)	49 (1)	595	
Excluded	290 (20)	2		
Notified to the Insurance Institute at Brno	—	—	—	302
<i>Cases still under investigation at 30 November 1932</i>				
Disease due to:				
lead and its compounds	39 (4)	16	55 (4)	18
mercury	2	—	2	15
arsenic	—	1	1	—
manganese	2	—	2	—
benzene, its homologues, and nitro and amido-derivatives of the aromatic series	6	4	10	1
carbon bisulphide	4	1	5	—
sulphuretted hydrogen	5	1	6	—
carbon monoxide	2	2	4	2
Serious and persistent eczema (cancer) due to soot, paraffin, tar, creosote, anthracene, pitch and similar substances as well as sequelae of such forms of eczema (or cancer)	21 (3)	10	31 (3)	5
Cancer of the lungs due to radium radiation or emanations	19 (17)	2 (1)	21 (18)	—
Anthrax	—	1	1	—
Diseases of the muscles, bones or joints in workers engaged in the manipulation of pneumatic drills or hammers or in pneumatic riveting	9	—	9	19
Diseases of the deeper respiratory passages due to the harmful effect of basic slag	1	—	1	—
Serious pulmonary diseases due to quartz and iron dust	87 (4)	5	92 (4)	63
Diseases due to chromates	4	—	4	2
Deafness or hardness of hearing approaching deafness due to noises and vibration	15	—	15	13
Serious cataract	45	3	48	6
Serious and complicated forms of nystagmus	1	1	2	13
Totals	262 (28)	47 (1)	309 (29)	157

The figures in brackets indicate fatal cases.

France

No statistics are available except for cases notified in France; the figures given below relate to 1923-1931.

LEAD POISONING

	1923	1924	1925	1926	1927	1928	1929	1930	1931
Foundries and rolling mills (lead and zinc), metal foundries, other operations connected with metallic lead	139	186	187	203	182	172	191	197	156
Manufacture of weights; electric apparatus	1	4	11	2	—	3	2	6	7
Plumbing, chimney repairing, coppersmith's work	17	27	13	26	24	21	32	54	44
Printing	26	40	26	31	38	48	62	63	39
Manufacture of white lead, minium, and compounds of these	150	91	125	105	37	31	25	44	21
Chemical industries	26	18	14	26	13	19	19	15	15
Glass, crystal and pottery manufacture	23	33	21	43	25	29	33	16	14
Painting in the building trade	41	32	29	13	26	20	22	22	18
Other branches of painting	35	31	23	25	16	23	23	20	15
Naval dockyards: (blow-pipe work)	31	5	—	6	6	37	20	27	16
Storage batteries	249	313	427	385	322	512	658	472	343
Enamelling on metals	278	463	456	632	335	596	746	735	422
Various	9	6	11	8	16	14	13	11	4
Total	1,025	1,249	1,343	1,505	1,040	1,525	1,846	1,682	1,114

MERCURY POISONING

	1923	1924	1925	1926	1927	1928	1929	1930	1931
Carrotting of skins	3	} 6	5	{ —	—	2	—	—	—
Hair cutting	1					—	—	4	8
Manufacture of mercury thermometers	1	—	—	3	—	1	—	—	1
Manufacture of electric batteries	—	1	—	—	—	—	—	1	1
Hat making	—	—	—	1	—	—	—	—	—
Industrial photography	—	—	—	1	—	—	—	—	—
Storage batteries	—	—	—	—	1	12	2	11	12
Chemical industries	—	—	—	—	—	3	4	—	—
Manufacture of artificial silk; supports for films	—	—	—	—	—	2	—	—	1
Mercury vapour lamps	—	—	—	—	—	1	—	3	—
Mercury gilding	—	—	—	—	—	1	—	1	1
Pharmaceutical specialities	—	—	—	—	—	1	—	1	—
Fur manufacture	—	—	—	—	—	—	—	—	1
Manufacture of mercury switches in the electrical industry	—	—	—	—	—	—	—	—	1
Total	5	7	5	8	4	23	6	21	26

BENZENE POISONING

From 1 July 1931: 6 cases (boot and shoe manufacture; rubber factories (2); manufacture of pigments; manufacture of chemical products; manufacture of supports for films).

X-RAYS

From 1 July 1931 : 1 case (male nurse, partial permanent incapacity).

Apart from diseases notified in virtue of the Compensation Act, a certain number of cases of occupational origin are still *notified* in accordance with the Decree of 1929, which abrogates and replaces the previous Decree of 1927.

From 1927 to 1931, the central service received 675 notifications, comprising:

Hydrocarbons (20); methyl and ethyl chlorides (10); aniline, its homologues and nitro and chlorinated compounds, benzene and its nitro and chlorinated derivatives (65); nitrous fumes (7); carbon monoxide, phosgen and other toxic gases (40); chlorine and chlorides (41); sulphuretted hydrogen, sulphur dioxide, etc. (27); phosphorus and compounds (17); mineral oils (petroleums) (11); pitch, tars, paraffin (16); cement (104); caustic products (117); acid fumes (129); intense exposure to light (7); cellulose varnishes, acetate of cellulose (5); silicious dust (8); carbon bisulphide (8); arsenic and its compounds (13); lime (6); radium (1); hydrocarbons of the aliphatic series and their chlorinated derivatives (2); chrome and chromic acid (4); dymethyl-sulphate (1); bases (10); various (7).

In conclusion, the permanent enquiry engaged in since 1910 by the factory inspection service in regard to cases of *anthrax* notified has enabled the following figures to be assembled :

	1928	1929	1930	1931
Hides and skins	37	48	24	20
Wool	14	10	7	7
Hair.	—	—	3	1
Slaughterhouses and bones	1	—	1	—
Transport	1	1	—	—
Various	1	2	—	1
	54	61	35	29

Germany

The first year after the law came into force (1926) it involved a general expenditure of 119,762.15 RM., which represented, with a total of 162 cases, 0.08 per cent. of the expense for accidents.

Expenditure was distributed as follows in round figures : 36,900 RM. for medical treatment, 37,230 RM. for payment of benefits, and 1,500 RM. for benefits to dependants, or about 76,000 RM.; 12,180 RM. were spent on prophylaxis in regard to occupational disease, and 32,000 RM. on administrative expenses.

Calculated on the basis of the total number of insured workers, the application of the Act cost in 1926 1 pfennig per insured worker and less than one-tenth of a pfennig for 100 RM. of wages.

From 1926 to 1931 the cost of compensation for occupational diseases and its ratio to that of accidents in RM. is shown by the following table :

1926	1927	1928	1929	1930	1931
212,186	474,928	713,039	2,536,664	8,911,371	10,135,200
0.10	0.21	0.29	0.61	2.09	2.81

Restricting investigation to the figures for 1930 and 1931, it is found that the *transition benefits* paid by the industrial corporations (*Berufsgenossenschaften*) to 135 sick workers in 1930 and 201 in 1931 cost 37,600 and 62,800 RM. respectively; the campaign against causes of occupational disease 6,081 RM. in 1930 and 10,600 RM. in 1931. On the other hand, the cost of administration fell from 951,568 RM. in 1930 to 709,501 RM. in 1931, or 25 per cent.

Cases notified reached a maximum in 1929 and cases compensated in 1930. It was found that 11.26 per cent. of the notifications were incorrect, or a total of 1,403 in 1930 as against that of 1,090 in 1931. Heading the list of cases notified and compensated (since the coming into force of the new Order) there is now found silicosis, followed by lead poisoning, which formerly occupied first place. These are followed by infectious diseases, increased in comparison with the figures for 1930, and thereafter those due to compressed-air tools.

The number of occupational diseases compensated for the first time by the trade corporations (*Berufsgenossenschaften*), in the course of the year (1930-1931), fell sharply (30.8 per cent.), as did likewise the number of fatal cases (from 554 to 333), giving the following figures:

Fatal cases	1929	1930	1931
Silicosis	303	474	267
Carbon monoxide poisoning	12	23	16
Poisoning by lead and its compounds	20	17	11
Infectious diseases	5	19	9
Poisoning by arsenic and its compounds	—	2	8
Tropical diseases	—	8	7

Further, in 1931 there occurred three deaths from each of the following causes : benzene, sulphuretted hydrogen, X-rays and radium, basic slag; and one fatal case from each of the following: carbon disulphide, chronic diseases of the skin due to soot, paraffin, etc., and Schneeberg lung disease.

Fatal cases represented, in 1931, 14.54 per cent. of cases compensated for the first time, as against 17.02 in 1930 and 18.03 in 1929.

As regards *total incapacity*, there occurred in 1931 109 cases (in 1930, 234), of which 79 were silicosis (1929, 94; 1930, 190), 17 infectious diseases (8; 13), 8 lead poisoning (30; 12), 2 poisoning by manganese (5; 8), 2 carbon monoxide poisoning (1; 1), 1 X-rays.

Partial incapacity amounted to 1,848 cases (1929: 1,471; 1930: 2,467), of which 1,051 were silicosis (812; 1,616), 352 lead poisoning (371; 441), 109 infectious diseases (34; 45).

CASES OF OCCUPATIONAL DISEASE, NOTIFIED AND COMPENSATED FOR THE FIRST TIME FROM 1926 TO 1931

— 43 —

Occupational diseases	Number of cases notified							Number of cases compensated for the first time ¹						
	1926	1927	1928	1929	1930	1931	Total	1926	1927	1928	1929	1930	1931	Total
1. Diseases caused by lead or its compounds	3,129	3,329	3,421	3,456	2,832	2,055	18,225	211 (7)	256 (12)	329 (6)	421 (20)	470 (17)	371 (11)	2,088 (73)
2. Diseases caused by phosphorus	3	2	4	3	5	—	17	1 (1)	—	—	—	1	—	2 (1)
3. Diseases caused by mercury or its compounds	23	90	66	91	78	67	415	5	8	7	10	13	6	49
4. Diseases caused by arsenic or its compounds	23	51	41	67	90	107	379	—	3	5 (1)	14 (4)	22 (2)	30 (8)	74 (15)
5. Diseases caused by manganese compounds	—	—	—	17	30	8	55	—	—	—	11	17	6	34
6. Diseases caused by benzol or its homologues	113	113	135	323	373	265	1,322	3 (2)	11 (2)	14 (4)	14 (2)	33 (5)	24 (3)	99 (18)
7. Diseases caused by carbon bisulphide	57	86	68	53	12	41	347	5	—	6	4	2	10 (1)	27 (1)
8. Diseases caused by sulphuretted hydrogen	—	—	—	102	96	73	271	—	—	—	—	8	6 (3)	14 (3)
9. Diseases caused by carbon monoxide	—	—	3	426	503	463	1,395	—	—	—	22 (12)	48 (23)	34 (16)	104 (51)
10. Diseases caused by X-rays and other forms of radiant energy	16	3	12	22	26	27	106	5	—	3	6	5	9 (3)	28 (3)
11. Chronic and chronically recurrent skin diseases caused by galvanising operations	—	—	5	260	268	221	754	—	—	—	10	26 (1)	32	68 (1)
12. Chronic and chronically recurrent skin diseases caused by various kinds of foreign wood	—	—	—	29	44	41	114	—	—	—	5	7	5	17
13. Chronic and chronically recurrent skin diseases caused by soot, paraffin, tar, anthracene, pitch and similar substances	34	42	37	202	317	230	862	1	1 (1)	5 (2)	25 (3)	44 (2)	32 (1)	108 (9)
14. Diseases of the muscles, bones and joints caused by work with compressed air apparatus	—	—	—	331	334	214	879	—	—	—	31	74	88	193
15. Diseases of the respiratory system and lungs caused by powdered basic slag (silicosis)	—	—	—	36	16	18	100	—	—	—	9 (4)	7 (3)	7 (3)	23 (10)
16. Serious pneumoconiosis (silicosis)	—	—	1	14,482	6,161	3,076	23,720	—	—	—	1,209 (303)	2,280 (474)	1,397 (267)	4,886 (1,044)
17. Selmeberg miner's lung disease	—	1	1	7	6	2	20	—	1	2	1	1	1 (1)	6 (1)
18. Deafness or hardness of hearing approximating to deafness caused by noise	—	—	—	148	208	110	466	—	—	—	11	60	40	114
19. Cataract	—	—	—	179	86	53	318	7	42	46	113	48	42	298
20. Ankylostomiasis	—	—	—	18	11	17	46	—	1	—	—	1	1	3
21. Tropical diseases, spotted fever, scurvy	—	—	—	181	657	474	1,312	—	—	—	3 (2)	11 (8)	14 (7)	28 (17)
22. Infectious diseases	—	—	—	681	1,390	1,029	3,100	—	—	—	47 (5)	77 (19)	135 (9)	259 (33)
Total	3,398	3,717	3,800	21,114	13,603	8,591	51,233	268 (10)	323 (15)	417 (13)	1,919 (355)	3,255 (551)	2,290 (333)	8,522 (1,280)

¹ Fatal cases are given in brackets.

Great Britain

The statistics published by Great Britain provide an extremely interesting analysis as to incidence, and especially as to expenditure involved by occupational sickness insurance. A summary of the figures for the periods 1908 to 1914 and 1922 to 1928, as well as those for 1925 to 1931, especially as regards factories, will be given. Nevertheless, in consideration of these figures it must once again be taken into account that during this period the schedule was considerably extended, and that in 1923 an important change was brought about in the rate of benefits paid for accidents and occupational diseases. Fatal cases are given in brackets.

	1908-1914	1922-1928
Number of persons employed	50,382,030	66,071,398
Annual average.	7,197,433	9,438,771
Cases of occupational disease	40,568 (253)	113,184 (214)
Cases of accident	2,780,033 (25,653)	3,019,715 (18,487)
Per 1,000 workers employed:		
Occupational diseases	0.805	1.713
Occupational diseases — deaths.	0.005	0.003
Accidents	55.18	45.70
Accidents — deaths	0.51	0.28
Occupational diseases per 100 accidents.	1.5	3.7
Deaths due to occupational diseases per 100 fatal accidents.	1.00	1.2
Cost of a fatal case due to occupational disease in proportion to cost of fatal accident (= 100)	1.02	0.9
Cost of a case of disablement due to occupational disease in proportion to cost of a case of disablement due to accident (= 100)	1.44	11.9

The figures presented by the English statistics are given for seven large industrial groups : navigation, factories, docks, mines, quarries, constructional work and railways.

It is interesting to examine the incidence and cost of compensation for *occupational* diseases for the group headed "*factories*" in proportion to those for all the seven industrial groups covered.

Period 1925-1931	In factories	In all seven industrial groups
Workers employed	12,778,684	50,925,293
Annual average.	1,825,526	7,275,042
<i>Occupational diseases:</i>		
Fatal cases	214	244
per 100 fatal accidents	3.9	1.3
Cases of disablement	13,873	123,323
per 100 accidents (disablement)	1.04	4.1
Number of deaths per 1,000 workers employed	0.016	0.004
Number of occupational diseases per 1,000 workers employed	1.09	2.42
Benefits paid for disablement	£430,872	£4,124,433
per 100 benefits paid for accidents (disablement)	3	11.7
Benefits paid for fatal cases	£47,147	£54,718
per 100 benefits paid for fatal accidents.	3.2	1.04

In 1931, 39 per cent. (9,415) of the cases of incapacity due to disease were cases in regard to which compensation had commenced in the preceding year (these cases attained for accidents only 14.7 per cent.) and constituted 73.7 per cent. of the benefits paid.

The bulk of the diseases was represented by miners' nystagmus, which with other diseases affecting miners constituted 80 per cent. of the occupational disease. The rest is represented by skin diseases due to dust and liquids, by lead poisoning, by ulceration of the skin or forms of cancer, other occupational diseases and anthrax.

For the period 1928 to 1931 the figures per 100 cases of disease are as follows :

	1928	1929	1930	1931
Miners' nystagmus	57	52	54	57
With other diseases affecting miners (beat hand, etc.), total	87.9	87.5	87.3	88.5
Skin diseases due to dust and liquids	8.1	8.9	9.3	8.7
Lead poisoning	1.9	1.5	1.5	1.1
Ulceration of the skin and cancer . .	1.4	1.5	1.3	1.1
Other occupational diseases (including anthrax)	0.7	0.6	0.7	0.6

It is necessary also to draw attention to the increase in cases of skin diseases, which from 270 in 1919 attained the number of 1,679 in 1931.

In conclusion, it is of interest to examine certain data relative, for example, to the number of cases of diseases and accidents compensated for the whole of the seven industrial groups, as compared with those for factories and mines :

NUMBER OF CASES OF ACCIDENTS AND OF OCCUPATIONAL
DISEASES COMPENSATED (PER 100 PERSONS EMPLOYED)

	All 7 groups	Factories	Mines
1926.	5.30	3.54	16.98
1927.	6.19	3.72	19.52
1928.	6.24	3.75	21.35
1929.	6.46	3.80	23.01
1930.	6.42	3.71	22.35
1931.	5.77	3.11	21.88

COST OF COMPENSATION PER PERSON EMPLOYED IN EACH OF THE
7 INDUSTRIAL GROUPS (IN SHILLINGS AND PENCE)

	1929	1930	1931
Navigation	25/10	27/6	22/10
Factories.	8/8	8/10	8/5
Docks	53/3	61/1	54/4
Mines	65/6	64/3	68/3
Quarries	25/3	29/2	27/3
Constructional work.	28/9	24/6	16/2
Railways.	12/3	11/3	10/10
Cost per person for all the 7 groups taken together	17/8	17/10	17/7

NUMBER OF CASES OF OCCUPATIONAL DISEASES COMPENSATED
FOR THE FIRST TIME IN THE COURSE OF THE YEAR

Disease	1926	1927	1928	1929	1930	1931
Anthrax	26	20	34	34	32	16
Lead poisoning	177	154	195	154	176	93
Mercury poisoning	5	1	1	—	—	4
Phosphorus poisoning	—	1	—	1	—	—
Arsenic poisoning	2	3	2	2	2	1
Poisoning by nitro and amido derivatives of ben- zene and its homologues	17	10	13	27	34	21
Poisoning by carbon bi- sulphide	—	—	—	7	—	—
Poisoning by nitrous fumes	3	7	7	1	3	1
Poisoning by Gonioma Kamassi	—	—	—	1	—	—
Chrome ulceration	30	14	14	48	52	28
Ulceration of the skin	58	31	36	51	20	24
Epitheliomatous cancer	85	55	112	83	81	87
Scrotal epithelioma (chim- ney-sweeps' cancer)	2	38				
Miners' nystagmus	1,771	1,802	2,555	2,577	3,066	2,729
Compressed-air illness	9	—	—	—	6	7
Subcutaneous cellulitis: of the hand (beat hand)	1,151	2,461	1,443	1,828	1,589	1,390
over the patella (miner's beat knee)	1,392	2,202	2,655	3,452	3,599	3,194
Acute bursitis over the el- bow (miner's beat elbow)	203	355	398	463	449	465
Inflammation of the syno- vial lining of the wrist joint and tendon sheaths	174	253	270	372	359	394
Cataract in glass workers	2	1	1	1	1	1
Telegraphists' cramp	1	2	—	—	—	—
Writers' cramp	1	—	—	1	2	1
Twisters' cramp	1	—	—	1	5	2
Dope poisoning	—	2	—	2	1	2
Dermatitis	712	897	1,170	1,405	1,499	1,328
Ulceration of the mucous membrane of the nose or mouth	1	3	—	—	—	—
Ulceration of the corneal surface of the eye	2	16	1	2	3	—
Manganese poisoning	4	12	1	—	—	—
Poisoning by dinitrophenol	—	18	—	—	—	—
Cataract (molten metal)	8	11	15	5	15	8
Total	5,837	8,369	8,923	10,518	10,994	9,796

CASES OF INCAPACITY DUE TO OCCUPATIONAL DISEASES AND FATAL
CASES IN THE SEVEN INDUSTRIAL GROUPS (1925-1931)

	1925	1926	1927	1928	1929	1930	1931
Various industries	1,413 (34)	1,495 (22)	1,722 (20)	2,052 (46)	2,388 (45)	2,568 (28)	2,235 (19)
Docks	19 (2)	17 (5)	28 (1)	38 (1)	36 (2)	22 (—)	19 (—)
Mines	15,779 (3)	13,187 (—)	15,273 (2)	14,772 (3)	16,126 (3)	16,847 (2)	16,828 (1)
Quarries	5 (—)	6 (—)	22 (—)	5 (—)	14 (—)	9 (—)	15 (—)
Construc- tional work	27 (2)	25 (—)	13 (—)	21 (—)	25 (—)	50 (—)	69 (—)
Railways	11 (—)	19 (—)	19 (2)	24 (1)	19 (—)	18 (—)	27 (—)
Navigation	2 (—)	2 (—)	2 (—)	3 (—)	3 (—)	2 (—)	2 (—)
Total	17,256 (41)	14,751 (27)	17,079 (25)	16,915 (51)	18,611 (50)	19,516 (30)	19,195 (20)

The figures in brackets represent fatal cases.

AMOUNT OF COMPENSATION (CASES OF INCAPACITY, FATAL CASES)

	Various industries		Mines		Other groups		All seven groups	
	Cases of incapacity	Deaths	Cases of incapacity	Deaths	Cases of incapacity	Deaths	Cases of incapacity	Deaths
	£	£	£	£	£	£	£	£
1925	44,986	6,949	609,656	115	1,385	1,326	656,027	8,390
1926	56,163	4,646	540,726	1,297	2,504	—	599,393	5,943
1927	57,146	3,962	488,338	249	3,008	1,067	548,492	5,278
1928	57,261	9,621	501,990	992	2,881	250	562,132	10,863
1929	70,732	10,076	488,207	829	3,264	615	562,203	11,520
1930	75,211	7,929	505,458	611	2,656	—	583,325	8,540
1931	69,373	3,964	540,005	220	3,483	—	612,861	4,184

Switzerland

1. — CASES OF CHRONIC POISONING

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	Total ¹
Acetylene (technical)			1	1		1						3
Acids—mineral (sulphuric, hydrochloric, nitric acid)	9	6	7	8	11	15	11	11		7	11	96
Acids—organic (acetic, etc.)			1		1	3	1					6
Alkalis (potash, caustic soda)			1	2						1		4
Alkaloids		1	3	1	1		2	1				9
Ammonia			1	1	1		2	4	2	1		12
Aniline and its homologues (toluidine, etc.)	8	5	7	14	8	9	13	6	6	6		82(13)
Arsenic and its compounds	1	2					1	1			2	7
Benzene and its nitro and halogen derivatives (benzidine, naphthol, etc.)	8	7	5	7	3	7	4	6	7	5		59 (3)
Calcium and its compounds (chloride)			1	1	1	1						4
Ditto: organic compounds									1			1
Carbon bisulphide				2	1	3	2	3	2			16
„ monoxide	9	2	2	8		1	2	3	8	3		38 (2)
„ oxychlorides (phosgen)		1	1	1	1		1					5
Chrome and chromates	1	1	1	1			2	7		1		14
Cyanogen and its compounds	1	2			1	2		2		1		9
Dimethylsulphate	1											1
Formaldehyde					1	2			5			6
Halogen compounds (bromide, chloride, fluorine)	2	1	1	2	3	6	7	8	6	1		37
Ditto: ethers of the halogen acids (bromide and ethyl and methyl chlorides)	1	1	1				1		2	2		11 (1)
Ketones and aldehydes of the aromatic series		1										1
Lead and its compounds	32	45	43	38	41	56	53	88	62	51		509 (18)
Mercury and its derivatives	6	3	7	17	10	11	14	25	15	21		132 (1)
Nitrous gas	2	2	2		2	5	3		3	5		24 (2)
Nitroglycerine							1					1
Petroleum spirit	1	1	3	2	1	3	1	1	6	5		24 (1)
Phenol and its derivatives	2											2
Phenylhydrazine				1								1
Phosphorus (chloride)	1				1	1	3	2	2	1		11 (1)
Phosphorus (yellow)		1	1				1		1			4
Sulphuretted hydrogen	4	1	1	3	1		2	1	4	1		18
Tar, pitch etc.		1	1	1	1		2	2	4	4		16
Tetrachlorethane							1	2	1			4 (3)
Trichlorethylene	1									1		2
Turpentine				1	1				1	2		5
Various					4	2	3	3	12	5		29
Total	90	88	92	110	98	130	134	174	155	132		1,203 (45)

¹ Fatal cases in brackets.

II. — CASES OF DERMATITIS COMPENSATED

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	Total ¹
Acids-mineral (sulphuric, hydrochloric, nitric acid)	9	17	16	14	12	14	22	15	21	22	162 (1)
Ditto: organic (acetic etc.)	1	1		3	2	2	1	5	4		19
Alkalis (potash, caustic, soda)	4	7	14	19	17	18	29	22	26	28	184 (3)
Alkaloids	1	6	11	14	5	3	4	10	4	2	60
Ammonia	2	4	3	3		7	6	8	9	4	46 (3)
Aniline and its homologues (toluidine, etc.)	1	6	5	6	9	2	11	6	9		55
Ditto and halogen derivatives		1									1
Arsenic and its compounds					1	2	1	1			5
Benzene and its homologues					2	1	3	2	1		9
Ditto and its nitro and halogen derivatives (benzidine, naphthol, etc.)	2	7	13	7	18	12	10	13	15	12	109
Calcium and its compounds	7	10	8	10	15	11	13	13	9	7	103 (1)
Ditto: organic compounds			3	5	3	2	1	1	3	1	19
Chlorates			1		1	1		1			4
Chrome and chromates	1	5	2	5	7	6	4	16	11	11	68
Cyanogen and its compounds			1		2	6	6	8	11	3	37 (1)
Dimethylsulphate									1		1
Formaldehyde			1	1	2	2	3	1	4	6	20
Halogen compounds (bromide, chloride, fluorine)	4	3	5	7	6	2	12	9	8	6	62
Ditto: ethers of the halogen acids (bromide and ethyl and methyl chlorides)	1										1
Ketones and aldehydes of the aromatic series					2			1	1		4
Lead and its compounds	1	2			1	2			1	2	9
Mercury and its derivatives							1	1		4	6
Petroleum spirit	1	4	11	10	5	12	18	16	13	15	105
Phenylhydrazine	1	1							2	1	5
Sulphur compounds		1		2	2	2	5		1	2	15
Tar, pitch etc..		3	6	8	13	17	8	16	18	27	116 (1)
Tetrachlorethane		1		1							2
Turpentine	12	8	10	19	15	16	14	42	26	22	184 (1)
Viscose (cellulose)		8	5	3	9	15	15	11	11	4	81 (3)
Substances of unknown composition				6	6	4	1	7	5	3	32
Sulphuretted hydrogen						2					2
Tin chloride					1		1		2		4
Various, products acting simultaneously					20	26	14	13	7	12	92
Total	48	95	115	143	176	187	203	238	223	194	1,622 (14)

¹ Chronic cases in brackets.

III. — CASES OF CHRONIC POISONING
(COMPENSATION NOT COMPULSORY)

	1922-27	1928	1929	1930	1931	Total ¹
Antimony and its compounds	2	1			1	4
Borax		1				1
Cement and lime	1		3	2		6
Copper (acetate, oxide)	2					2
Dust: Quartz (silicosis)	1				13	14 (8)
"Vim"				2		2 (1)
"Other dusts"	2	2	3		4	11
Ethyl acetate				1		1
" alcohol				2		2
Lacquers (fumes)		2				2
Metals soldering (fumes)	3	2	2			7
Naphtha, petrol, mineral oils		1		2	2	5
Naphthylamine (beta)					1	1
Nitrous gas				1		1
Pitch (fumes)			1			1
Pyridine					1	1
Spray painting (fumes)		3	2			5
Sulphur dioxide				2		2
Tin and phosphorus				1		1
Various	7	3	1	2	1	14
Zinc (fumes and dust)	5	2	2	1		10
" oxide					1	1
Total	23	17	14	16	24	94 (9)

¹ Fatal cases in brackets.

IV. — CASES OF DERMATITIS COMPENSATED (NOT COMPULSORY)

	1922-24	1925	1926	1927	1928	1929	1930	1931	Total ¹
Acetone	1	1		2	1	2	1	3	11
Acid-cinnamic, formic and salicylic		1					2		3
Acid-oxalic (salts of sorrel)	2	3	1			1	4	1	12
Alkalis (lyes)		1	5	6	4	11	3	3	33 (1)
Alcohols			7	2	3	5	1	2	20
Antimony and its compounds				1	1				2
Asbestos (dust)		3							3
Boron	1								1
Brine	1	3	2	5	1	2	3	2	19
Cement, lime	118	83	81	117	170	206	224	298	1,297(10) ¹
Colours, lacquers, varnishes	12		6	4	6	22	15	10	114(1) ¹
Copper compounds	1	3	1		1	1	1	1	9
Diphenyl oxide							1		1
Diseases of animal origin			3		1	1		1	6
Dish washing water			1						1
Dressing substances			1	1	2	1			5
Dust	12	2	7	8	7	10	6	6	58
Ebonite, india rubber	2	1							3
Explosives	1				1			2	4
Fatty substances		2			1	3	2		8
Glucoside							1		1
Glues (various types)	5	2	2	8	2	3	2	5	29
Graphite		1				1			2
Hydrazine						2			2
Mica					3				3
Naphthylamine				1			1		2
Nickel compounds, nickel plating	8	10	7	18	39	22	23	3	130
Petrol	11	12	9	17	11	22	12	9	103
Photography (baths)			1	2	1	2	1		7
Polishing of wood	16	11	6	8	9	19	22	12	102
Powders cleaning			3	2	6	1	6	3	21
„ (insecticides)			3						3
Soap (various)	14	15	7	25	17	25	23	14	140 (2)
Soldering (acid for)	1	3	5	4	1	2	1	2	19
Soluble glass			1				1		2
Sugar (manufacture)					1	2	2		5
Tobacco (nicotine)	2	2		1	1		3	2	11
Tanning (hides)		1	2			2		1	6
Textiles (fibres, cotton, silk)				4	6	2	8	1	21
Thionaphthol			1						1
Toluene, xylene		1				1			2
Various (no indication)	93	13	10	19	28	44	46	45	298
Various oils	15	18	10	29	17	29	25	18	161 (1)
Vegetables (dust, manipulation of extracts)	3	1	9	1	7	18	10	13	62 (1)
Wax and resins	6	1		3	1	1	3	2	17
“Zikol”					5	2	1		8
Zinc and compounds	2		2	1	2			2	9
Total	327	202	198	300	358	470	459	464	2,278 (16)

¹ Chronic cases in brackets.

V. — COST OF OCCUPATIONAL DISEASES

Year	Cost of compensated occupational diseases	As a percentage of the total coast of occupational accidents
	Swiss francs	
1926	261,965	0.725
1927	277,792	0.750
1928	360,996	0.900
1929	353,322	0.770
1930	395,222	0.840
1931	281,670	0.660

APPENDICES

I

**Draft Convention concerning Workmen's Compensation
for Occupational Diseases**

(Adopted by the International Labour Conference at its 1925 Session)

Article 1. — Each Member of the International Labour Organisation which ratifies this Convention undertakes to provide that compensation shall be payable to workmen incapacitated by occupational diseases, or, in case of death from such diseases, to their dependants, in accordance with the general principles of the national legislation relating to compensation for industrial accidents.

The rates of such compensation shall be not less than those prescribed by the national legislation for injury resulting from industrial accidents. Subject to this provision, each Member, in determining in its national law or regulations the conditions under which compensation for the said diseases shall be payable, and in applying to the said diseases its legislation in regard to compensation for industrial accidents, may make such modifications and adaptations as it thinks expedient.

Article 2. — Each Member of the International Labour Organisation which ratifies this Convention undertakes to consider as occupational diseases those diseases and poisonings produced by the substances set forth in the Schedule appended hereto, when such diseases or such poisonings affect workers engaged in the trades or industries placed opposite in the said Schedule, and result from occupation in an undertaking covered by the said national legislation.

SCHEDULE

List of diseases and toxic substances

Poisoning by lead, its alloys or compounds and its sequelae.

List of corresponding industries and processes

Handling of ore containing lead, including fine shot in zinc factories.

Casting of old zinc and lead in ingots.

Manufacture of articles made of cast lead or of lead alloys.

Employment in the poly-graphic industries.

Manufacture of lead compounds.

Manufacture and repair of electric accumulators.

Preparation and use of enamels containing lead.

Polishing by means of lead files or putty powder with a lead content.

All painting operations involving the preparation and manipulation of coating substances, cements or colouring substances containing lead pigments.

Handling of mercury ore.

Manufacture of mercury compounds.

Manufacture of measuring and laboratory apparatus.

Preparation of raw material for the hat-making industry.

Hot gilding.

Use of mercury pumps in the manufacture of incandescent lamps.

Manufacture of fulminate of mercury primers.

Work in connection with animals infected with anthrax.

Handling of animal carcasses or parts of such carcasses including hides, hoofs and horns.

Loading and unloading or transport of merchandise.

Poisoning by mercury, its amalgams and compounds and its sequelae.

Anthrax infection.

II

Definitions of Industrial Disease

Simple, direct relation

The Minister of Commerce (France, 1901): "Disease exclusively brought about or clearly provoked by occupational activity."

Court of Appeal (France, 1903): "Disease to which it is not possible to attribute a given origin or date, and which is nothing other than the consequence of the habitual exercise of a certain industry."

Jouanny: "Disease contracted through following a certain occupation and arising therefrom, whereby it is regarded as a further occupational risk."

Martin, Et.: "Disease due entirely to a given occupation or the conditions under which it is effected."

Committee for the Study of Occupational Diseases (Italy, 1902): "Acute or chronic disease violently and exclusively caused by following an occupation or the necessary consequence of a specific industry" (Sanarelli). "Any disease definitely and concretely due in an exclusive manner to a given industrial process and which causes death or temporary or permanent working incapacity" (Mangiagalli).

Raths (in *Dammer's Dictionary*, 1891): "Those diseases which appear exclusively or principally amongst individuals belonging to certain trades and are produced by the very nature of the occupation."

Hayhurst: "An occupational disease may be defined as an affliction which is the result of exposure to an industrial health hazard. There may be exposure to more than one hazard with corresponding complicated affliction. An industrial health hazard may be defined as any condition or manner of work that is unnatural to the physiology of the human being so engaged."

Pieraccini: "Any disease which at times is the consequence of an acute violent cause — the peculiar property of an accident — and the principal effective cause of which is generally, or the single effective cause of which is more rarely, to be sought in slow pathological, homo- or heterogenic action spread over a period of time and even at times differentiated in space and dependent on, or connected with the occupation engaged in by the victim."

Verhaegen: "Any affection occurring on account of work, and involving injury to the system."

Lefort: "A disease which may be foreseen on account of the very work engaged in; far from being an exceptional occurrence it is the normal consequence of the work accomplished."

Ferrannini: "Direct occupational diseases include, all those dependent on working conditions (which are closely connected with the work effected and the constitutional elements of the occupation); indirect occupational diseases, all those which frequently affect workers in consequence of their general living conditions."

"Constant", "Continuous", "Repeated"

Imperial Insurance Office (Germany, 1892): "The result in certain occupations of a kind of work harmful to the health and constantly exercised over a long period of time."

Bourgeois: "A continuous and lasting condition due to a cause which is equally continuous and lasting."

Kley: "A disease which occurs after prolonged duration in an industry or notoriously as the consequence of harmful influence of this industry from which the worker is not able to escape."

Curschmann: "State of ill-health 'determined by repeated influences exerted over a long period of time, and conditioned by a certain regularity as to the type of work, or by concomitant circumstances each of which in itself does not suffice to produce a bodily injury which can be subjectively or objectively recognised'."

The Minister of Commerce (France, 1899): "Disease caused by the prolonged exercise of certain unhealthy trades."

Mirman: "Disease, the exclusive or essential organic cause of which is the continued exercise of an occupation."

Biondi: "Any disease which is the manifestation of harmful causes connected with the exercise of an occupation, causes which exert on repeated and multiple occasions injurious effect spread over a period of time."

Fatality

Debray: "Any lasting affection occurring in a slow, insidious and progressive manner in a worker and said to be the almost fatal consequence of the continued exercise of his occupation."

D'Anna: "Industrial diseases and accidents are the direct and exclusive morbid effects of work engaged in, of the occupation followed; they are so closely connected with the work or occupation that the worker is unable to escape from the disease or from the risk of accident unless by abandoning his work or the occupation which provides him with a living."

Unhealthiness

Paulet: "The remote consequence of the fatigue and unhealthiness connected with an occupation."

Fatigue

See *Unhealthiness*

Dialhesis

Boucher: "A slow poisoning or diathesis resulting from the normal exercise of an occupation."

Incidence in an Occupation

Weyl: "Diseases generally brought about by the activity of the individual worker, as well as all frequent morbid symptoms affecting a given class of workers."

Glibert: "Any disease which occurs with unusual frequency in a particular occupation together with that which is manifestly due to occupational risk."

Teleky: "Any disease which is of more frequent incidence amongst individuals belonging to a given occupation than amongst the rest of the population, in consequence of the exercise of the occupation in question."

Petri: "Any specific disease peculiar to various industries, and likewise any affection attacking even persons not occupied in the industries but affecting, nevertheless, with special regularity those so occupied."

Source of Livelihood

Gardenghi: "His occupation is, for a given worker, not only any given occupation considered in the abstract, or impersonally; it is his special occupation and must be considered in relation to the particular conditions of the working surroundings in which the worker is obliged to be effectively engaged in order to earn his living."

Complex Definitions

Van der Borcht: "The consequence of long-continued action of harmful influences in special occupations, influences which exert their effect exclusively on workers belonging to certain occupations, or at least affecting them more frequently than members of the general population."

Devoto: "Occupational pathology and clinical study should be considered like ordinary pathology and clinical study, the origin and manifestations of which are to be sought in the occupation engaged in, or in the working or objective conditions, or again in the constitution of the worker himself which is unadapted to the work."

Ranelletti: "Diseases which are not only the exclusive or principal consequence of the exercise of a given occupation but also all common diseases, the direct or indirect source of which is the occupation followed."

III

Periodical Examination in Unhealthy Trades

The Correspondence Committee on Industrial Hygiene (I.L.O.) at its Düsseldorf Meeting (13 September 1926) passed the following resolution which was communicated to the States Members of the Organisation:

(1) That medical inspection should be carried out by medical factory inspectors, or where such were not available, by doctors appointed by the competent authority.

(2) That the industries and callings which in the first place should be subjected to periodical medical inspection should be the following:

<i>Industry</i>	<i>Minimum periodicity of visits of inspection</i>
Manufacture of lead colours and other lead compounds	At least once a month
Mining of lead, zinc, mercury and their ores	Ditto.
Manufacture of storage batteries	Ditto.
Manufacture and use of aromatic nitro and amido derivatives	Ditto.
Grinding of basic slag.	Every three months
Manufacture of india-rubber, lead processes, carbon bisulphide processes, benzol processes.	Every month
Use of lead in the pottery industry	Ditto.
Manufacture of alkaline chromates	Ditto.
Compressed air work	According to special circumstances
Hair cutting	Every three months
Manufacture and use of carbon bisulphide in the manufacture of artificial silk	Every six months
Hot enamelling on metal	Every month
Tinning or zincing of sheet metal by alloys containing lead	Every three months
Chromolithography by powdered colours containing lead	Ditto.

SECOND PART

COMPENSATION FOR OCCUPATIONAL DISEASES IN THE VARIOUS COUNTRIES

With the exception of a few special Acts of a general character (Belgium) or particular character (Acts on miners' phthisis, etc.) which will be analysed later, in the majority of countries compensation for occupational diseases is regulated by Acts dealing with occupational accidents. Measures issued for this purpose are to be found either embodied in these Acts or in supplementary texts issued in virtue of certain provisions which they contain. In the latter case, the occupational disease is almost always assimilated to the accident, with the result that measures concerning the latter are applicable in their entirety to the former. Nevertheless, certain special features inherent in the nature of the disease have necessitated the adoption of special measures which will be reviewed in the following countries.

With this in view, a short account will be given of the legal measures adopted in the various countries for compensation for occupational diseases without dwelling on the provisions which are identical to those concerned with occupational accidents properly so-called.

There shall be given at the outset for each country the list of legislative texts in force, followed by a special study of the legislative measures relative to occupational diseases in each instance where these differ from those concerning accidents. The plan adopted is as follows:

1. Definition of the occupational disease.
2. Field of special application.
3. Notification.
4. Rights of the victim and his dependants.
5. Incapacity: assessment, grading.
6. Waiting period.
7. Benefits: calculation, payment, duration.
8. Procedure as regards compensation — revision.

9. Medical treatment: organisation, limit, duration.
10. Disputes.
11. Calculation of premiums.
12. Responsibility of employer.
13. Special committees entrusted with questions relative to occupational diseases; administration of the Act, studies, enquiries, etc.

ARGENTINA

(a) Act No. 9688 of 11 October 1915 relative to liability for industrial accidents. (*Ley no. 9688 de accidentes del trabajo, el 11 de octubre de 1915.*) (*Bol. del Dep. Nac. del Trabajo*, 1918, p. 137.)

(b) Decree of 14 January 1916 regulating administration of the Act concerning liability for industrial accidents. (*Reglamentacion de la ley no. 9688 sobre accidentes del trabajo, Enero 14 de 1916.*) (*Bol. del Dep. Nac. del Trabajo*, 1918, p. 145.)

(c) Decree of 19 February 1932 adding undulant fever to the list of occupational diseases appended to the Act No. 9688. (*Decreto incorporando la fiebre ondulante a la lista de las enfermedades profesionales que contiene la reglamentacion de la ley no. 9688, 19 de Febrero de 1932.*) (*Rev. de Derecho Social*, 1932, Vol. II, No. 1, p. 81.)

The Act of 1915 (Article 22) assimilates certain occupational diseases to accidents, and the Regulatory Decree of 1916 enumerates these as follows: pneumoconiosis, pulmonary tabacosis, anthracosis, siderosis, poisoning by lead, mercury, copper, arsenic, carbon disulphide, hydrocarbons and phosphorus, ophthalmia due to ammonia, anthrax, dermatosis, and ankylostomiasis. Finally, the Decree of 19 February 1932 adds undulant fever to the above list. The Decree of 1916 defines occupational disease as a disease caused exclusively by the occupational activity of the injured person.

In order to maintain his claim the worker must be suffering from one of the occupational diseases in the list, and must have contracted it during the year preceding his disability in the occupation in question. If it should be proved that the workman suffered from this disease before entering such employment, then no compensation shall be paid.

Compensation shall be claimed from the employer in whose service the disability occurred. If it is proved that the latter could have been contracted in the service of another employer, such employer will be held responsible. Where the disease, owing to its nature, could have been contracted gradually, the other employers in whose service the workman was employed

during the last year on the kind of work which caused the disease are liable to the last employer for a proportionate share of the compensation to be fixed by arbitration if there is any controversy concerning it.

AUSTRALIA

Commonwealth

An Act relating to compensation to employees of the Commonwealth for injuries suffered in the course of their employment. No. 24 of 1930. Assented to 14 August 1930.

Occupational diseases are enumerated in the second schedule appended to the Act of 14 August 1930 which applies to Commonwealth employees (public works). Where an employee is suffering from any of the diseases mentioned in the first column of the second schedule to the Act and is thereby incapacitated from earning full wages at the work at which he was employed; or the death of an employee is caused by any of those diseases, and the disease was caused within twelve months prior to the date of incapacity by the employment, the employee or his dependants are entitled to compensation as if the diseases were a personal injury by accident arising out of or in the course of employment. The diseases contained in the schedule are as follows:

Description of disease	Description of process
Arsenic, phosphorus, lead, mercury or other mineral poisoning.	Any employment involving the use or handling of arsenic, phosphorus, lead, mercury or other mineral, or their preparations or compounds.
Anthrax.	Woolcombing, woolsorting; handling of hides, skins, wool, hair, bristles or carcasses.
Zymotic diseases.	Persons employed in a hospital or quarantine station, or in an ambulance brigade.
Poisoning by benzol or its homologues or their nitro and amido derivatives (di-nitro-benzol, anilin and others).	Any process involving the use of benzol or its homologues or their nitro and amido derivatives or their preparations or compounds.
Poisoning by carbon bisulphide.	Any process involving the use of carbon bisulphide or its preparations or compounds.
Poisoning by nitrous fumes.	Any process in which nitrous fumes are evolved.
Poisoning by cyanogen compounds.	Any process in which cyanogen compounds are used.

Description of disease	Description of process
Poisoning by carbon monoxide.	Any process in which carbon monoxide is used or evolved.
Chrome ulceration.	Any process involving the use of chromic acid, or bichromate of ammonium, potassium or sodium or their preparations.
Dermatitis produced by dust or caustic or corrosive liquids or ulceration of the mucous membranes of the nose or mouth produced by dust.	Any industrial process.
Ankylostomiasis.	Any employment involving exposure to hookworm infestation.
Pneumoconiosis.	Quarrying or stone crushing or cutting.
Nystagmus.	Mining or quarrying, or stone crushing or cutting.
Subcutaneous cellulitis of the hand (beat hand).	
Subcutaneous cellulitis over the patella (miner's beat knee).	
Acute bursitis over the elbow (miners' beat elbow).	
Inflammation of the synovial lining of the wrist joint and tendon sheath.	

If the employee at the time of, or immediately before, the incapacity was employed in any process mentioned in the second column of the second schedule and produces a certificate from a duly qualified medical practitioner that the disease contracted is the disease or one of the diseases in the first column set opposite the description of the process, that disease shall, in the absence of proof of the contrary, begin to have their cause in the employment in which the employee was engaged.

If the Commissioner is satisfied that the employee, at the time of entering the employment of the Commonwealth, wilfully and falsely represented himself has not having previously suffered from the disease, compensation shall not be payable.

If the disease is of such a nature as is contracted by a gradual process, the Commonwealth shall be entitled to be indemnified by any other employers (if those employers are also liable to pay compensation) who employed the employee during the period of twelve months immediately preceding the incapacity. Compensation is paid to the employee by the Commonwealth.

New South Wales

(a) Act to extend the provisions for the payment of compensation to persons disabled by lead poisoning in or upon the Broken Hill mines;

to establish a Medical Board with jurisdiction in the County of Yancowinna; to amend the Workmen's Compensation Act, 1916, and certain other Acts; and for purposes connected therewith, No. 31 of 1922. (L. S., 1922, Austral. 3.)

(b) An Act to amend the Workmen's Compensation (Lead poisoning — Broken Hill) Act, 1922, and for purposes connected therewith. No. 26 of 1924, assented to 17 November 1924. (L. S., 1924, Austral. 4.)

(c) An Act to amend the law relating to workmen's compensation; to constitute a Workers' Compensation Commission, and to define its jurisdiction, powers and duties; to provide for the compulsory insurance by employers against their liabilities in respect of injuries to workers, and also for the regulation and licensing of insurers and the deposit by them with the Colonial Treasury of certain sums; to establish a fund to meet the cost of the administration of the commission and to provide for the contribution thereto by insurers; to amend the Workmen's Compensation Act, 1916, and the Workmen's Compensation (Amendment) Act, 1920, and to limit the future operation of these Acts; to amend the Workmen's Compensation (Silicosis) Act, 1920, and certain other Acts; and for purposes connected therewith. 16 Geo. V, No. 15, assented to 18 March 1926. (L. S., 1928, Austral. 5.)

(d) An Act to amend the Workers' Compensation Act, 1926; and for purposes connected therewith. 17 Geo. V, No. 32, assented to 15 March 1927. (L. S., 1927, Austral. 3.)

(e) An Act to amend the Workers' Compensation Act, 1926 to 1927, the Workmen's Compensation (Broken Hill) Act, 1927, and certain other Acts; and for the purposes connected therewith. 20 Geo. V, No. 36, assented to 29 November 1929. (L. S., 1929, Austral. 9 A.)

(f) An Act to provide for compensation for certain persons out of the Fund established under the Workmen's Compensation (Broken Hill) Act, 1920-1929; to amend that Act; to validate certain payments by the Joint Committee; and for purposes connected therewith. 20 Geo. V, No. 43, assented to 23 December 1929. (L. S., 1929, Austral. 9 B.)

The definition of occupational diseases is to be found in the Act of 29 November 1929, amending the Workmen's Compensation Acts Section 2 a (1) and is as follows:

Injury means personal injury arising out of and in the course of employment and includes a disease so arising whether of sudden onset or of such a nature as to be contracted by gradual process other than a disease caused by silica dust.

The Act of 24 November 1922 deals with lead poisoning, and in virtue of the amendment contained in the Act of 17 November 1924 this term comprises also the sequelae of lead poisoning.

For occupational diseases in general the ground covered is that indicated in the Acts on industrial accidents, No. 36 of 1929. On the other hand the Act of 24 November and its subsequent amendments apply exclusively to workers on the metalliferous mines at Broken Hill.

As regards notification of occupational diseases in general, the provisions relative to industrial accidents are applicable.

Legal measures relative to the rights of the victim of occupational disease and his dependants are similar to those for industrial accidents. The Act on lead poisoning at Broken Hill contains no special provisions relative to notification in regard to which the provisions of the Acts on accident compensation are valid. As regards the rights of the worker and his dependants the provisions applicable are similar to those in the case of industrial accidents, in so far as it is a case of occupational diseases in general. The victims of lead poisoning at Broken Hill must, however, fulfil certain conditions laid down under a special scheme established by the Act of 24 November 1922 in order to qualify for compensation.

The Act of 24 November 1922 accords the workers suffering from lead poisoning compensation in proportion to the length of their service. A special scale establishes the amount of this compensation as follows: not more than 10 years' service, a sum not exceeding £50; over 10 years and not more than 20 years, a sum not exceeding £200; over 20 years and not more than 30 years, a sum not exceeding £300; over 30 years, £400.

The compensation provided by this scheme is granted to a workman who has been excluded or withdrawn from employment consequent upon the issue of a medical certificate proving his disability, as well as to workers unlawfully refused re-employment when disabled by lead poisoning and subsequently certified as fit to return to employment. The right to compensation is forfeited if the worker returns to work of his own accord without being certified as fit to do so. He shall be guilty of an offence against the Act and liable to a penalty. Finally, a mineowner from whom compensation is recoverable shall provide and pay a duly qualified medical practitioner to give treatment.

Where the injury is a disease of such a nature as to be contracted by a gradual process, compensation shall be payable by the employer in whose employment the worker is or who last employed him. Any employer who during the twelve months preceding the worker's incapacity employed him in any employment to the nature of which the disease was due shall be liable to make to the employer by whom compensation is payable such contributions as, in default of agreement, may be determined by the Commission for Industrial Accidents created by

the principal Act. The worker or his dependants shall furnish all information necessary for the purpose of fixing liability.

The Act of 1922 contains similar provisions. In the case of a contribution involving participation of several employers towards the cost of compensation, participation is based on agreement between the mineowners, or in default of this on the number of shifts worked by the worker in the employment of each mineowner. The organisations called upon to administer the legal measures are in general, for occupational diseases, the Workers' Compensation Commission established by the Act of 18 March 1926; at Broken Hill a special Medical Board created by the Act of 1922 and its later amendments. This Board comprises three medical practitioners representing respectively the Governor, the mineowners and the workers, the chairman being the medical officer in charge of the Bureau of Medical Inspection at Broken Hill.

The Medical Board established by the Act of 1922 is given powers to perform the duties of certifying surgeon or medical referee in respect of workers disabled by disease.

Northern Territory

An Ordinance relating to compensation to workmen for injuries suffered in the course of employment and other purposes. No. 6 of 1931, dated 13 May 1931. (*L. S.*, 1931, Austral. 1, with amendments.)

The occupational diseases compensated are to be found in the fourth schedule of the Ordinance of 13 May 1931. Where it is certified by a medical referee that a worker is suffering from a disease inscribed in the schedule and is thereby disabled from earning his full wages, the said worker shall, provided the disease is due to the nature of his employment, receive compensation and likewise in the case of inability to continue his work or in the case of death. The diseases contained in the schedule are as follows:

Description of disease	Description of process
Arsenic, phosphorus, lead, mercury or other mineral poisoning.	Any employment involving the use or handling of arsenic, phosphorus, lead, mercury or other mineral, or their preparations or compounds.
Anthrax.	Woolcombing, woolsorting; handling of hides, skins, wool, hair, bristles or carcasses.

Description of disease	Description of process
Zymotic diseases.	Persons employed in a hospital or quarantine station, or in an ambulance brigade.
Poisoning by benzol or its homologues or their nitro and amido derivatives (dinitro-benzol, anilin and others).	Any process involving the use of benzol or its homologues or their nitro and amido derivatives or their preparations or compounds.
Poisoning by carbon bisulphide.	Any process involving the use of carbon bisulphide or its preparations or compounds.
Poisoning by nitrous fumes.	Any process in which nitrous fumes are evolved.
Poisoning by cyanogen compounds.	Any process in which cyanogen compounds are used.
Poisoning by carbon monoxide.	Any process in which carbon monoxide is used or evolved.
Chrome ulceration.	Any process involving the use of chromic acid, or bichromate of ammonium, potassium or sodium or their preparations.
Dermatitis produced by dust or caustic or corrosive liquids or ulceration of the mucous membranes of the nose or mouth produced by dust.	Any industrial process.
Ankylostomiasis.	Any employment involving exposure to hookworm infestation.
Pneumoconiosis.	Quarrying or stone crushing or cutting.
Nystagmus.	Mining or quarrying, or stone crushing or cutting.
Subcutaneous cellulitis of the hand (beat hand).	
Subcutaneous cellulitis over the patella (miner's beat knee).	
Acute bursitis over the elbow (miner's beat elbow).	
Inflammation of the synovial lining of the wrist joint and tendon sheath.	

In order to qualify for compensation, the victim of an occupational disease must have been employed during the twelve months preceding the date of disablement or death as certified by a medical practitioner.

The fact of having contracted a disease inscribed in the first column of the schedule in course of an operation or process indicated in the second column shall be considered as entitling the worker to compensation, the onus of proof to the contrary resting with the employer.

Compensation shall be recoverable from the employer who last employed the worker during the period of twelve months preceding disablement. Where the worker has been in the

employment of several employers and the disease is one of gradual evolution, the successive employers are jointly responsible and their contributions may be fixed by agreement, or, failing that, by arbitration.

The amount of compensation shall be calculated with reference to the earnings of the worker under the employer from whom compensation is recoverable.

Queensland

(a) Consolidated Text of the Workers' Compensation Acts, 1916-1923. (*L. S.*, 1925, Austral. 5, Appendix.)

(b) Act to amend the "Workers' Compensation Acts, 1916-1923" in certain particulars. 16 Geo. V, No. 18, assented to 5 November 1925. (*L. S.*, 1925, Austral. 5.)

(c) Act to amend the "Workers' Compensation Acts, 1916-1925" in certain particulars. 17 Geo. V, No. 17, assented to 11 November 1926. (*L. S.*, 1928, Austral. 8.)

(d) Act to amend the "Workers' Compensation Acts, 1916-1926" in certain particulars. 20 Geo. V, No. 22, assented to 17 December 1929. (*L. S.*, 1929, Austral. 8.)

Article 14 A of the consolidated text of the 1916-1923 Acts on workmen's compensation provides that where a worker at the date of death or incapacity was employed in any employment mentioned in the second column of the table of industrial diseases given below and has died or is suffering from any disease mentioned in the first column, such worker, or in the case of death his dependants, shall be entitled to compensation. The table of diseases is as follows:

Description of disease	Description of employment
Arsenic, phosphorus, lead, mercury, copper, zinc, or other mineral poisoning and their sequelae.	Any employment involving the use or handling of arsenic, phosphorus, lead, mercury, copper, zinc, or other mineral or their preparations or compounds.
Anthrax.	Wool-combing; wool-sorting; handling of hides, skins, wool, hair, bristles, or carcasses.
Septic poisoning.	Any work involving the handling of meat or the manufacture of meat products or animal by-products.
Asiatic cholera, bubonic plague, diphtheria, measles, mumps, scarlet fever, small-pox, tetanus, typhoid fever, or other zymotic disease.	Any employment at, in, about, or in connection with any hospital or ambulance brigade.

This schedule of diseases and processes or occupations has been supplemented by the provisions of Article 14 B of the same consolidated text as follows:

Description of disease	Description of employment
Silicosis of the lungs; miners' phthisis; pneumoconiosis.	
Ankylostomiasis.	
Nystagmus.	
Subcutaneous cellulitis of the hand (beat hand).	Mining or quarrying, or stone crushing or cutting.
Subcutaneous cellulitis over the patella (miner's beat knee).	
Acute bursitis over the elbow (miner's beat elbow).	
Inflammation of the synovial lining of the wrist joint and tendon sheath.	
Miner's itch.	
Copper itch.	
Dermatitis caused by working in mineralised or acid water.	
Caisson disease.	
Bakers' phthisis.	Baking.
Millers' phthisis.	Flour-milling.

Finally, the schedule of occupational diseases given under Article 14 A has been modified by the provisions of the Act of 5 November 1925 (section 2 (4)) which repeals the provision —

Septic poisoning.	Any work involving the handling of meat, or the manufacture of meat products or animal by-products;
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and inserts in lieu thereof the following:

Carbon bisulphide poisoning.	Any employment involving the use of carbon bisulphide or its preparations or compounds.
Carbon monoxide poisoning.	Any employment in which carbon monoxide is used or evolved.
Chrome ulceration.	Any employment involving the use of chromic acid or bichromate of ammonium, potassium, or sodium or their preparations.
Poisoning by benzol or its nitro and amido derivatives (Dinitro-benzol, aniline and similar substances).	Any employment involving the use of a nitro or amido derivate of benzol, or its preparations or compounds.
<i>Dermatitis venenata.</i>	Any employment involving the use of vegetable or mineral matter.
Poisoning by nitrous fumes.	Any employment or process in which nitrous fumes are involved.
Poisoning by cyanogen compounds.	Any employment or process in which cyanogen compounds are used.

Epitheliomatous cancer or ulceration of skin or of the corneal surface of the eye due to mineral oils, pitch, tar, or tarry compounds.

Handling of mineral oils, pitch, tar, or tarry compounds.

Septic poisoning.

Any work involving the handling of meat, or the manufacture of meat products or animal by-products; wool-combing, wool-sorting; handling of hides, skins, wool, hair, bristles, or carcasses.

Further, in the first column of diseases given in Article 14 B of the principal Act the words "pulmonary tuberculosis" are inserted after the word pneumoconiosis.

According to the latest amendments (Act No. 22 of 1929, sections 5 and 6) the provisions of the Article 14 A are stated to be valid for workers who at the date of death or incapacity had been continuously resident in Queensland during one year at least.

The provisions of Article 14 B are valid for workers who have been employed in Queensland in one of the occupations mentioned in the list and who satisfy the following conditions:

- (a) have resided in the country during five consecutive years preceding the date of incapacity or death and have been during this period of five years employed in one or other of the occupations indicated for a period of at least 300 days;
- (b) have been resident in the country for at least five years during a period of seven years immediately preceding the date of death or incapacity and have been employed in one or other of the occupations mentioned during at least 500 days in the course of this seven-year period.

The diseases enumerated in Article 14 A are compensated similarly to accidents. The amount of compensation for the diseases enumerated in Article 14 B is as follows: in the case of death, a funeral allowance not exceeding twenty pounds; an allowance to the widow of one pound per week with an additional allowance of ten shillings a week for each child under fourteen years of age, the total amount not to exceed fifty shillings per week, or the sum of four hundred pounds in all. In the case of total or partial incapacity for work, the worker shall receive a sum not exceeding one pound per week during incapacity with a supplement not exceeding ten shillings per week for each child under fourteen years of age, the total amount not to exceed fifteen shillings per week, or the sum of four hundred pounds in all. This scale of compensation may be increased by Order

in Council at the instigation of the Governor. The Insurance Commissioner is not obliged to redeem by a lump sum any weekly payments for diseases enumerated under Article 14 B.

The payment of compensation for occupational diseases under Articles 14 A and 14 B shall not affect the rights of a worker to receive compensation in respect of a disease to which those sections do not apply if such a disease is a personal injury by accident within the meaning of the Act.

With regard to the diseases enumerated in Article 14 B, the worker must possess a medical certificate stating that prior to the incapacity he has not suffered previously from any of the diseases enumerated in the list or from tuberculosis.

As regards the diseases enumerated under Article 14 B, medical treatment may be granted over and above compensation within a reasonable limit fixed by the Insurance Commissioner: whenever a medical practitioner or referee certifies that the worker's condition is capable of cure or of mitigation by hospital or sanatorium treatment, the Commissioner has power to substitute this for the payment of compensation.

South Australia

An Act to consolidate certain statutes relating to compensation to workers for injuries suffered in the course of their employment. No. 2103, assented to November 30 1932. (Acts of Parliament of South Australia, Adelaide, 1932, Act No. 2103.)

The occupational diseases are to be found in the second schedule of the Act of 1932 which describes the diseases due to the nature of employment as follows:

Description of disease	Description of employment.
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Ankylostomiasis.	Mining.
Antimony poisoning or its sequelae.	Any process involving the use of antimony or its preparations or compounds.

Description of disease	Description of employment
Asthma or asthmatic attacks.	Any process involving working in contact with or the inhalation of the dust of red pine or blackwood.
Carbon monoxide poisoning or its sequelae.	Any process involving working in contact with or the inhalation of carbon monoxide gas.
Dermatitis.	Any process involving exposure to or working in contact with the dust of blackwood.

The schedule may be extended from time to time by Proclamation in the Gazette.

Further, Part X of the 1932 Act, which contains special provisions relative to compensation for occupational diseases contracted at Port Pirie, applies in full the definition given for occupational diseases in general, these being covered by the law in precisely the same manner as industrial accidents subject to the reservation involved in the processes listed in the second column of the schedule.

The special provisions of the Act relative to Port Pirie likewise covers factories in the district (Broken Hill Associated Smelters).

Notification is required under similar conditions to those applying in the case of accidents. Any medical practitioner attending a workman employed by the smelting company whom he believes to be suffering from a disease contracted during employment shall give notice in writing to the Board which can then instruct the worker to present himself for medical examination.

Victims of occupational disease are entitled to the same compensation as victims of industrial accidents, and the same applies to the workers at Port Pirie provided that they do not refuse to undergo the medical examinations arranged by the Board. Nothing in the section of the Act dealing with industrial diseases shall affect the right of a workman to recover compensation in respect of any disease not affected thereby. The assessment and fixing of the date of disablement are entrusted to a certifying medical practitioner. If the worker is not satisfied with the action of the certifying medical practitioner he is entitled to demand re-examination by a medical referee, whose decision shall be final.

The amount of compensation is calculated with reference to the earnings of the worker under the employer from whom

compensation is recoverable. Apart from this, all measures applicable to industrial accidents are also valid in the case of occupational disease.

There is no provision for medical treatment in the case of occupational disease.

The employer who last employed the workman during the preceding twelve months is responsible for compensation. If during this period the worker has been employed by several employers and the disease in question is of such a nature as to have been contracted gradually, any other employers who during the twelve months prior to the date of disablement employed the worker in question on work liable to cause the disease shall be responsible to make to the employer from whom compensation is recoverable such contributions as in default of agreement may be determined by arbitration in the Act. The worker is in turn obliged to furnish all requisite information with a view to fixing responsibility.

At Port Pirie a Medical Board has been constituted to exercise the powers and perform the functions of a certifying medical practitioner and medical referee. This Board comprises three duly qualified medical practitioners residing and practising in the municipality of Port Pirie. No medical practitioner holding an appointment as a medical officer for the smelting company or to any trade union consisting wholly or partially of workmen employed by the said company shall be appointed to or hold office on the Board.

Tasmania

An Act to provide for the establishment of a relief fund in connection with mining and other allied industries, and for the payment of compensation to employees in such industries in respect of certain occupational diseases contracted by such employees in the course of their employment. 19 Geo. V, No. 52, assented to 15 January 1929. (*L. S.*, 1929, Austral. 2.)

The schedule appended to the Act contains enumeration of the occupational diseases covered by it. They are as follows: silicosis, pneumoconiosis, fibrosis, lead poisoning, arsenic poisoning, carbon-monoxide poisoning, ankylostomiasis, nystagmus.

The Act applies to employees employed by or on behalf of the Crown in relation to this State in the same manner as it would apply to those in private employment.

In order that a worker or his dependants shall be eligible for compensation under the Act, he must have been engaged in mining operations in Tasmania for five years prior to the Act coming into force and have been medically examined and certified free from disease on engagement and, further, his average weekly earnings shall not exceed seven pounds and his employment must consist of manual labour. The worker forfeits his right to compensation if in the case of partial incapacity he refuses other work at equal remuneration which he is capable of performing.

The Act contains a provision requiring that every worker — except those who have been employed in mining operations in Tasmania for a period of five years prior to the Act coming into force — shall present himself for medical examination on engagement. The result of this examination shall be communicated in writing to the Inspector of Mines and thereafter transmitted to the Compensation Board. Procedure is similar in regard to any of the diseases scheduled under the Act. The employer for his part is obliged to furnish a quarterly report to the Board containing amongst other particulars information as to cases of the scheduled diseases which have occurred amongst his employees.

Assessment of disability is entrusted to a certifying medical practitioner.

In the case of unmarried employees, compensation shall amount to £1 15s. during incapacity, with a supplement of 10s. per week for married employees and an additional supplement of 5s. for each child. Payment of a lump sum may be granted in agreement with the Board, the total compensation paid not to exceed £600.

Once the existence of incapacity has been established the worker in question is required to submit to further periodical examinations. The Act does not, however, state in an explicit fashion that the subsequent examinations are with the intention of revision or cancellation of right to compensation.

The constitution of compensation funds is effected as follows: each employer pays in respect of each employee a sum which shall not exceed one shilling per week per worker. The employer pays besides on behalf of and in respect of each employee a sum which shall not exceed sixpence per week

per worker. The State contributes a sum, like that of the employer, not exceeding one shilling per week per worker. The Act entitles the employer to deduct from the worker's wages any contribution which he has made on his behalf. In this respect the legal provisions in Tasmania relative to compensation may be said to occupy a middle place between those found in legislation dealing with accident compensation defrayed entirely by the employer and those contained in sickness insurance schemes which are based on equal contributions from the employers and workers.

The employer is obliged to make his contribution only in respect of the period during which his employees entitled to compensation are actually engaged in mining operations.

A board consisting of three members appointed by the Governor undertakes the administration of the Act. It includes one representative each for employers and workers, and a third member who is chairman of the board.

Victoria

An Act to consolidate the law relating to compensation to workers for injuries occurring in the course of their employment. No. 3806, assented to 12 February 1929. (*L. S.*, 1929, *Austral.* 22.)

Occupational diseases compensated are found in the fifth schedule and are dealt with in Articles 18, 24 and 25 of the Act of 12 February 1929. Article 18 stipulates that compensation must be granted provided that the certifying medical practitioner for the district in which the worker was employed certifies that the worker is suffering from a disease mentioned in the fifth schedule and is thereby disabled from earning full wages or has died from such a disease.

Article 24 specifies that the worker must have been employed on one of the processes mentioned in the second column of the fifth schedule at the date of or immediately before notification of the disease corresponding thereto, in which case it is considered in default of proof to the contrary as due to employment. The list of diseases comprised in the schedule is as follows:

Description of disease	Description of process
Anthrax.	Wool combing; wool sorting; handling of hides, skins, wools, bristles, and carcasses.

Description of disease	Description of process
Lead poisoning or its sequelae.	Any manufacturing or other process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any manufacturing process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any manufacturing process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any manufacturing process involving the use of arsenic or its preparations or compounds.
Septic poisoning from the handling of meat or meat products or its sequelae.	Any work involving the handling of meat or the manufacture of meat products or animal by-products in connection with the trade of a butcher or slaughterman.
Chrome ulceration or its sequelae.	Any process involving the use of chromic acid or bi-chromate of ammonium, potassium or sodium or their preparations.
Subcutaneous cellulitis or acute bursitis arising at or about the knee (beat knee).	Mining.
Subcutaneous cellulitis or acute bursitis over the elbow (beat elbow).	Mining.

In order to qualify for compensation the victim of an occupational disease must have been employed in the course of the twelve months preceding disablement as medically certified. If the worker is not satisfied with the result of the medical examination, he may be referred to a medical referee. The compensation shall be recoverable from the employer who last employed the worker during the said twelve months. Where the worker has been in the employment of several firms and the disease is one of gradual evolution, the employers in question must accept joint responsibility and compensation shall be recoverable by agreement, or, in default of this, by arbitration.

Western Australia

(a) Consolidated text of the Workers' Compensation Acts, 1912-1924. (*L. S.*, 1925, Austral. 2, Appendix.)

(b) An Act to amend the Workers' Compensation Act, 1912, No. 40. Assented to 16 January 1925. (*L. S.*, 1925, Austral. 2.)

(c) An Act to amend Section 4 of the Workers' Compensation Act, 1912, No. 14. Assented to 4 November 1925. (*L. S.*, 1925, Austral. 2.)

(d) An Act to amend Section 7 of the Workers' Compensation Acts, 1912-1924, etc., No. 34. Assented to 28 December 1927 (*L. S.*, 1927, Austral. 10.)

Article 7 of the consolidated text 1912-1924 containing the legislation relative to compensation for industrial accidents provides compensation for all wage earners suffering from any of the diseases mentioned in the third schedule to the Act. The disease must be due to the nature of any employment in which the worker was employed at any time within the twelve months previous to the date of disablement whether under one or more employers. The same Article assimilates such disease to a personal injury by accident within the meaning of the Act. The schedule, as established subsequent to amendments made by the Act of 16 January 1925 (Article 2) and proclamations of 30 January and 27 February 1925, is as follows:

Description of disease	Description of process
Arsenic, phosphorus, lead, mercury, or other mineral poisoning.	Any employment involving the use or handling of arsenic, phosphorus, lead, mercury, or other mineral, or their preparations or compounds.
Anthrax.	Wool-combing; wool-sorting; handling of hides, skins, wool, hair bristles or carcasses.
Zymotic diseases.	Medical officer, nurse, orderly, or other person employed in a hospital or quarantine station or in an ambulance brigade.
Poisoning by benzol or its nitro and amido derivatives (dinitrobenzol, anilin, and others).	Any process involving the use of a nitro or amido derivative of benzol, or its preparations or compounds.
Poisoning by carbon bisulphide.	Any process involving the use of carbon bisulphide or its preparations or compounds.
Poisoning by nitrous fumes.	Any process in which nitrous fumes are evolved.
Poisoning by cyanogen compounds.	Any process in which cyanogen compounds are used.
Poisoning by carbon monoxide.	Any process in which carbon monoxide is used, or evolved.
Chrome ulceration.	Any process involving the use of chromic acid or bi-chromate of ammonium, potassium, or sodium or their preparations.
Eczematous ulceration of the skin produced by dust, or caustic or corrosive liquids, or ulceration of the mucous membrane of the nose or mouth produced by dust.	Any industrial process.
Epitheliomatous cancer or ulceration of skin or of the corneal surface of the eye due to mineral oils, pitch, tar or tarry compounds.	Handling of mineral oils, pitch, tar or tarry compounds.

Description of disease	Description of process
Scrotal epithelioma (chimney sweep's cancer).	Chimney sweeping.
Compressed air illness.	Any process carried on in compressed air.
Trade spasms and cramps.	
Pneumoconiosis.	
Miner's phthisis.	
Ankylostomiasis.	
Nystagmus.	
Subcutaneous cellulitis of the hand (beat hand).	
Subcutaneous cellulitis over the patella (miner's beat knee).	Mining or quarrying, or stone crushing or cutting.
Acute bursitis over the elbow (miner's beat elbow).	
Inflammation of the synovial lining of the wrist joint and tendon sheath.	
Dermatitis.	

Compensation shall be recoverable from the employer who last employed the worker during the twelve months preceding disablement. When the worker has been in the employment of several employers during the period they are jointly responsible.

AUSTRIA

(a) Federal Act to amend certain provisions respecting the insurance of workers against accidents (Accident Insurance Act Amendment Act No. XVII), dated 16 February 1928. (*Bundesgesetz vom 16 Februar 1928 betreffend die Abänderung einiger Bestimmungen über die Unfallversicherung der Arbeiter (XVII Novelle zum Unfallversicherungsgesetz).*) (L. S., 1928, Aus. 7A.)

(b) Federal Act respecting sickness, accident and invalidity insurance of workers in agriculture and forestry (Agricultural Workers' Insurance Act) 18 July 1928. (*Bundesgesetz vom 18. Juli 1928, betreffend die Krankheitsfall- und Invalidenversicherung der Land- und Forstarbeiter (Landarbeiterversicherungsgesetz).*) (L. S., 1928, Aus. 7A.)

(c) Order of the Federal Minister of Social Administration to amend certain provisions respecting the insurance of workers against accidents (Accident Insurance Act Amendment Act No. XVII), dated 16 February 1928 (*Verordnung des Bundesministers für soziale Verwaltung vom 6. September 1928, betreffend die Berufskrankheiten in der Unfallversicherung der Arbeiter. Nr. 237.*) (L. S., 1928, Aus. 7B.)

(d) Order No. 232 of the Federal Minister of Social Administration to reissue the Salaried Employees Insurance Act, dated 22 August 1928. (*Verordnung des Bundesministers für soziale Verwaltung vom 22. August 1928, betreffend die Wiederverlautbarung des Angestelltenversicherungsgesetzes. No. 232.*) (L. S., 1928, Aus. 4B.)

(e) Order No. 229 of the Federal Minister of Social Administration concerning occupational diseases in the salaried employees' insurance system (Fourth Administrative Order in the Salaried Employees' Insurance Act), dated 3 September 1928. (*Verordnung des Bundesministers für soziale Verwaltung vom 3. September 1928, betreffend die*

Berufskrankheiten in der Angestelltenversicherung (IV. Durchführungsverordnung zum Angestelltenversicherungsgesetz). Nr. 229.) (L. S., 1928, Aus. 4C.)

(f) Order No. 79 of the Federal Minister of Social Administration in agreement with the Federal Minister of Agriculture and Forestry concerning occupational diseases deemed to be equivalent to industrial accidents in agricultural accidents in the Agricultural Workers' Insurance system, dated 6 February 1929. (*Verordnung des Bundesministers für soziale Verwaltung im Einvernehmen mit dem Bundesminister für Land- und Forstwirtschaft vom 6. Februar 1929, betreffend die den Arbeitsunfällen in der Landarbeiterversicherung gleichzuhaltenden Berufskrankheiten. Nr. 79.*) (L. S., 1929, Aus. 1.)

(g) Order No. 150 of the Federal Minister of Social Administration to promulgate the Accident Insurance Act as amended down to 1 January 1929, dated 9 March 1929. (*Verordnung des Bundesministers für soziale Verwaltung vom 9. März 1929, womit die Fassung des Unfallversicherungsgesetzes nach dem Stande vom 1. Januar 1929 verlaublich wird. Nr. 150.*) (L. S., 1929, Aus. 3.)

(h) Federal Act to amend and supplement certain provisions of the Federal Act of 18 July 1928 respecting the sickness, accident and invalidity insurance of workers in agriculture and forestry (Agricultural Workers' Insurance Act) (Agricultural Workers' Insurance Act Amendment Act No. 1), dated 18 July 1929. (*Bundesgesetz vom 18. Juli 1929 womit einige Bestimmungen des Bundesgesetzes vom 18. Juli 1929, B.G. Bl. Nr. 235, betreffend die Kranken-, Unfall- und Invalidenversicherung der Land- und Forstarbeiter (Landarbeiterversicherungsgesetz) abgeändert beziehungsweise ergänzt werden (I. Novelle zum Landarbeiterversicherungsgesetz) Nr. 253.*). (L. S., 1929, Aus. 6.)

The various accident insurance Acts — industry, agriculture, workmen's compensation — contain provisions in virtue of which certain diseases due to occupation are assimilated to industrial accidents ¹.

¹ The Insurance Act covering industrial workers (industries and transport undertakings covered by the Act) provides the following benefit in case of reduced working capacity due to an industrial accident:

(1) Prothesis and orthopaedic apparatus;

(2) An accident allowance payable from the fifth week following the accident (during the four weeks following the accident the injured worker is entitled to medical treatment and to a sickness benefit granted by the Sickness Insurance Fund).

In case of total incapacity and throughout its duration, the allowance, that is to say the entire allowance, amounts to two-thirds of the yearly earnings. In case of partial incapacity and throughout its duration, the allowance amounts to that fraction of the total allowance which corresponds to the degree of reduction of working capacity. When the reduction does not exceed one-sixth the allowance may be replaced, subject to agreement with the injured worker, by payment of a lump sum. The annual earnings in accordance with which the allowance is calculated must not be less than 240 schillings and must not exceed 2,400 schillings.

The Acts on accident compensation for agricultural workers provide the following benefits: treatment, including medical attention, sickness benefit, prothesis and orthopaedic apparatus, accident benefit and allowances for children. The accident allowance is payable to the injured worker from the date which marks the end of the curative treatment

In the case of occupational diseases occurring in industry, there must be diminished earning capacity amounting to at least one-third.

The various Orders issued specify the occupational diseases covered by the texts of the Acts.

In industry (Order of 3 September 1928) such diseases must be caused during work and must be due to the action of certain substances or agents enumerated as follows:

Lead and its compounds; chrome compounds; arsenic and its compounds; mercury and its compounds; phosphorus; benzol and homologues thereof, and nitro and amido compounds of the aromatic series; carbon bisulphide; soot, tar, pitch, paraffin, anthracene and allied substances; various forms of radiant energy, compensation being granted for (a) diseases caused by X-rays, (b) diseases caused by radio-active substances, (c) glass workers' cataract.

Besides the above, there have been assimilated to industrial accidents the following diseases:

Infectious diseases of workers in scientific institutes (laboratories) and workrooms, when it is proved that the disease in question has occurred within an occupation subjected to compulsory insurance;

Anthrax if contracted by a worker liable to insurance and employed in an establishment:

following the accident, and at latest from the beginning of the second year following the date of the accident.

In the case of total incapacity, the monthly allowance is equal to the basic rate multiplied by 20. In the case of partial incapacity, the allowance amounts to that fraction of the entire allowance which corresponds to the degree of reduced working capacity. It is only accorded when working capacity is diminished by more than one-third, and even in certain cases by more than one-fifth (forestry, saw-mills). When the reduction of working capacity is less extensive, but nevertheless attains 15 per cent., the allowance is replaced by a lump sum which may not exceed the amount of the monthly allowance multiplied by 50. When working capacity is reduced by less than 15 per cent. no allowance is paid.

The Workmen's Compensation Act provides the worker with an accident allowance payable from the date on which curative treatment rendered necessary by the accident ceases. In cases of total working incapacity, the allowance is 70 per cent. of the basic rate. In cases of partial working incapacity exceeding one-quarter, the allowance amounts to the corresponding fraction of the entire allowance. In cases of reduction of capacity below one-quarter, the worker is not entitled to any allowance or benefit.

In cases of death, various Acts provide for a contribution to funeral expenses (except in the case of salaried employees) and for allowances to dependants from the date of death.

- (a) in which hides, skins, animal wool, hair or bristles are worked up, or trade in the said materials or any articles manufactured therefrom is carried on;
- (b) establishments in which animals are kept or slaughtered, or the carcasses or offal of animals among whom anthrax occurs are worked up or destroyed.

Glanders if contracted by workers liable to insurance and employed in establishments in which glanders has occurred amongst the live stock.

In agriculture (Order dated 6 February 1929) the occupational diseases assimilated to industrial accidents are as follows:

Anthrax (under the same conditions as in industry).

Glanders „ „ „ „ „ „ „ „

Poisoning, if attributable to the use of artificial fertilisers with considerable dust content, such as basic slag, calcium cyanamide, quicklime, etc., in an establishment in which the worker was engaged in an employment liable to insurance;

Milkers' cramp, if attributable to the engagement of a worker in an employment liable to insurance;

Zymotic diseases contracted by workers in scientific institutions (laboratories) and workplaces attached thereto, if it is proved that the disease was caused by work in an employment liable to insurance. Further, there are assimilated to accidents diseases attributable to employment in connection with the same substances and sources of power enumerated in regard to industry, with the exclusion of glassworkers' cataract, wherever the worker affected has been engaged in employment liable to accident insurance.

Finally, for salaried employees the Order of 3 September 1928, provides the same list as that relating to industry, with, as in agriculture, omission of glassworkers' cataract.

BELGIUM

(a) Act respecting compensation for injury caused by occupational diseases. Dated 24 July 1927. (L. S., 1927, Belg. 7.)

(*Loi du 24 juillet relevant à la réparation des dommages causés par les maladies professionnelles.*)

(b) Royal Order relative to the organisation of insurance funds for victims of occupational diseases and to the creation of an administrative board for these funds and of a technical committee. Dated 15 November 1927.

(*A. R. relatif à l'Organisation du Fonds de prévoyance en faveur des victimes des maladies professionnelles, ainsi qu'à celle du Conseil d'administration de ce fonds et du Comité technique. Du 15 novembre 1927.*) (*Moniteur belge*, 1927, No. 325-26, p. 5209.)

(c) Royal Order to issue the list of occupational diseases and in respect of each of the industries or occupations in which they entitle the victim to compensation. Dated 30 January 1928.

(A. R. du 30 janvier 1928, donnant la liste des maladies professionnelles et pour chacune d'elles les industries ou professions où elles donnent lieu à réparation.) (L. S., 1928, Belg. 1 A.)

(d) Ministerial Order to specify the classes of wage-earning employees or employees placed on the same footing who are subject to the risk of lead or mercury poisoning or anthrax infection in the various classes of undertakings covered by the Act of 24 July 1927. Dated 23 November 1929.

(A. M. du 23 novembre 1929, déterminant les catégories d'ouvriers ou travailleurs assimilés qui courent le risque d'intoxication par le plomb ou le mercure ou d'infection charbonneuse dans les divers genres d'entreprises soumises à la loi du 24 juillet 1927.) (L. S., 1929, Belg. 8.)

(e) Ministerial Order to alter the classes of wage-earning employees or employees placed on the same footing who are subject to the risk of anthrax infection in the various classes of undertakings covered by the Act of 24 July 1927.

(A. M. du 3 décembre 1930, portant certaines modifications aux catégories d'ouvriers ou travailleurs assimilés qui courent le risque d'infection charbonneuse dans les divers genres d'entreprises soumises à la loi du 24 juillet 1927.) (L. S., 1930, Belg. 12.)

(f) Royal Order completing the list of occupational diseases and providing for each of these a list of industries or processes in respect of which compensation shall be accorded. Dated 30 June 1932.

(A. R. complétant la liste des maladies professionnelles et pour chacune d'elles les industries ou professions où elles donnent lieu à réparation. Du 30 juin 1932.) (L. S., 1932, Belg. 4.)

(g) Ministerial Order to specify the classes of workers or assimilated wage earners exposed to the risk of poisoning by phosphorus, arsenic, carbon disulphide, hydrocarbons, and to pathological affections due to radium, X-rays, or to skin affections. Dated 31 October 1932.

(A. M. déterminant les catégories d'ouvriers ou travailleurs assimilés qui courent le risque d'intoxication par le phosphore, l'arsenic, le sulfure de carbone, les hydrocarbures, des troubles pathologiques dus au radium, aux rayons X, ou d'affections de la peau. Du 31 octobre 1932.) (L. S., 1932, Belg. 7.)

A Bill introduced prior to the Act of 1891 on compensation for injuries affecting industrial workers in consequence of their occupation, limited claims for compensation merely to accidents of an occupational character. All amendments in favour of assimilation of occupational diseases to accidents for the purposes of compensation presented in course of the discussion of the Bill, either in 1891 or 1903, were rejected for various reasons. Thus the Act of 24 December 1903 on compensation for industrial accidents does not include occupational diseases.

In 1910, during the second International Congress on Occupational Diseases, the Belgian Minister of Labour and Industry voiced the necessity for legal compensation in the field of occupational diseases, as in that of accidents. This meant that workers suffering from these diseases should no longer come within

Article 1382 of the Civil Code, according to which there rested on them the onus of proof concerning the fault of the employer, even in the case of a disease contracted during work and in the workshop.

It was only in 1919, however, that a Bill was drafted with a view to providing compensation for occupational diseases. Efforts were made in preparing this draft to avoid the extension of compensation to cases of disease not clearly occupational in character, and to draft an Act which should be sufficiently elastic and should merely contain indispensable general principles, the administrative details being expressed in Royal Orders issued in application of the Act.

This draft Bill became law in 1927, and constitutes at the present time, together with the Royal Orders issued in application of the various provisions which it contains, the Statute which regulates compensation for occupational diseases.

The Act of 24 July 1927, which came into force in 1928 provides for the drafting of a list of occupational diseases, specifying in each case the industries or occupations in which compensation for these shall be granted. This list, contained in the Royal Order of 30 January 1928, is as follows:

List of diseases and forms
of poisoning

Poisoning by lead, its alloys
or compounds, and the
direct sequelae of such
poisoning.

List of industries or occupations

Treatment of ores containing lead,
including residues containing lead
from zinc works.
Manufacture of zinc and lead.
Smelting of scrap zinc and lead in
ingots.
Rolling of lead.
Extraction of silver from lead con-
taining silver.
Manufacture and handling of articles
made of lead or of lead alloys.
Manufacture of lead compounds.
Manufacture and repair of accumu-
lators.
Preparation and use of enamels con-
taining lead.
Polishing by means of lead filings or
putty powder with a lead content.
Processes involving the preparation or
handling of coating substances, ce-
ments or colours containing lead
compounds.
All other processes in which fumes or
dust containing lead may be gener-
ated.

List of diseases and forms
of poisoning

List of industries or occupations

Poisoning by mercury, its
amalgams and compounds,
and the direct sequelae of
such poisoning.

Treatment of mercury ores.
Manufacture of mercury compounds.
Manufacture of measuring and labora-
tory apparatus.
Preparation of raw materials for the
hat-making industry, including the
manufacture of felt hats.
Hot gilding.
Use of mercury pumps to produce a
vacuum.
Manufacture of explosives containing
mercury.
Handling of mercury and its amalgams.
Handling of animal substances capable
of conveying the anthrax virus.

Anthrax infection.

By the Royal Order of 30 June 1932, this list was completed
as follows:

List of diseases and forms of poisoning

List of industries or occupations

Poisoning by phosphorus, its com-
pounds, and the direct sequelae
of such poisoning.

All processes involving the produc-
tion and utilisation of phos-
phorus, as well as the elabora-
tion or utilisation of its toxic
compounds.

Poisoning by arsenic and its com-
pounds, with the direct sequelae
of such poisoning.

All processes involving preparation,
liberation or utilisation of ar-
senic or its compounds.

Poisoning by carbon disulphide,
with the direct sequelae of such
poisoning.

All processes involving the produc-
tion, liberation or utilisation of
this product.

(1) Poisoning by benzene, its ho-
mologues, and their nitro or
amido derivatives, with the
direct sequelae of such poison-
ing.

All processes involving the produc-
tion, preparation and utilisation
of this product.

(2) Poisoning by hydrocarbons of
the aliphatic series and their
chlorinated derivatives, with
the direct sequelae of such
poisoning.

Pathological troubles due to:

(a) radium and other radio-
active substances;

All processes involving the produc-
tion, elaboration or utilisation
of these products.

(b) X-rays.

All processes involving exposure
to their action.

Epithelioma.

All processes involving manipula-
tion of tar, pitch, bitumen,
mineral oils, paraffin, or all
compound products or residues
of this substance.

As regards accidents, Belgian legislation does not require
insurance against this risk, but it requires "compensation for

the injury". In theory, the employer therefore becomes his own insurance carrier, or he may even dispense with insurance by resorting to the Civil Code in regard to injury caused to his workers, but at the same time participating in the constitution of a guarantee fund which is eventually used in the case of bankruptcy of an employer. In practice the employer usually acts through a private insurance company (which must have the sanction of the Government) or joins a "Common Fund", in other words a special type of insurance constituted by employers, grouped usually in accordance with the various branches of industry.

With regard to insurance for occupational disease, on the other hand, insurance is compulsory, and the premiums are fixed by the Government, which recovers them through its finance administration. The premiums payable vary from one industry to another, and are deposited with a single central organisation: "the Insurance Fund for victims of occupational disease."

The Act shall not be applicable unless the disease has caused either the death of the victim or partial or total permanent incapacity for work, or temporary incapacity for work provided that it is total and lasts at least a fortnight. Further, the claim must be lodged within the prescribed delay.

The 1927 Act applies to workers in private or public undertakings in so far as they involve industries causing exposure to one of the occupational risks specified in the list.

Notification of occupational diseases is compulsory, and must be made to the insurance fund created in favour of victims of occupational diseases (see later). Heads of establishments (employers, managers or agents) are responsible for this, and the formalities to be complied with have been determined by Royal Order.

National and foreign workers have equal rights on condition that the country of origin of the latter grants equivalent advantages to Belgian workers. Where such reciprocity does not exist, the Act nevertheless applies to foreign workers who have been resident in Belgium for over three years, or where there is reason to believe that they have a definitely fixed abode in Belgium.

Assessment of incapacity is left to the medical practitioner in charge of the enquiry instituted by the Technical Committee

which constitutes, in the Insurance Scheme, one of the bodies entrusted with the administration of the Act. Where necessity arises, appeal may be made to medical specialists where their assistance is deemed essential.

Compensation is not accorded for cases of temporary incapacity except where it is total, and lasts at least for fifteen days. Under these conditions the worker is entitled to benefit equal to 50 per cent. of his average daily wage from the date of the day on which incapacity for work commenced. If the temporary incapacity is total at the end of the first six months after the beginning of incapacity for work, the daily compensation from the beginning of the seventh month shall be equal to two-thirds of the average daily wage¹.

If this incapacity becomes partial, the compensation shall be equal to the difference between the wage the worker is able to earn and two-thirds of his average daily wage prior to the illness.

In the case of permanent incapacity, an annual allowance shall be substituted for the temporary compensation as from the day on which the incapacity assumes a permanent character. In the event of permanent total incapacity, the allowance shall be equal to two-thirds of the average daily wage. In the event of permanent partial incapacity, the allowance shall be equal to the difference between the wage which the victim is able to earn and two-thirds of his average daily wage prior to the illness. In the case of sick persons permanently incapacitated whose condition absolutely necessitates the help of another person, the annual allowance may be allowed to exceed the rate of two-thirds, but may not exceed 100 per cent. In case of death, besides a sum of 500 francs for funeral expenses, the dependants are entitled to a life annuity varying in accordance with the case. For husband or wife, if neither divorced nor separated, this amounts to 25 per cent. of the annual wage, with an allowance for legitimate children or acknowledged illegitimate children who have lost either parent, provided in both cases that they are under eighteen years of age: a life annuity equal to 10 per cent. of the annual wage for each child is accorded, provided

¹ The recent revision of the Accident Insurance Act, which provides more ample benefits than formerly to victims of accident, has necessitated readjustment of the 1927 Act, at least as far as regards the benefit rates; this does not, however, in any way alter the general scheme of the Act.

that the total amount shall not exceed 30 per cent. of the said wage. This rate is increased to 15 per cent., with a maximum of 45 per cent. in the case of children who have lost both parents. Similar conditions govern the case of fatherless grandchildren under eighteen, provided that the victim leaves as beneficiaries neither husband nor wife nor children. Nevertheless, if there is no surviving husband or wife, but there are children as beneficiaries, the fatherless grandchildren shall share with the children the rate payable for each group of grandchildren, being fixed at 10 per cent. For the father and mother of the victim, where there are no other dependants, the annuity rate is equivalent to 15 per cent. of the annual wage for a single beneficiary and 25 per cent. if there are two beneficiaries. Brothers and sisters of the victim under eighteen, in the absence of other dependants, receive a sum equivalent to that granted to children. Where they exceed three in number the 10 per cent. rate is proportionally reduced.

Grants of every kind shall be increased for the payment of expenses of curative treatment, by special compensation allowance, on a scale to be drawn up by Royal Order. The worker has every liberty in his choice of medical attendant.

Wages serving as a basis for assessment of compensation shall be ascertained, as in the case of compensation for injuries resulting from industrial accidents. If the worker leaves the industry or occupation which has caused the disease since the disease appears, the wages serving as a basis shall be the actual wages received by the person concerned under the contract of employment during the year preceding leaving. If this wage cannot be ascertained, the wage taken as a basis shall be the average wage paid in the industry or occupation to workers of the same category during twelve months preceding the leaving of the person concerned.

When compensation consists of a life annuity, the Insurance Fund, on demand of the person concerned or his dependants, may pay a part not exceeding one-third of the value of the pension, in the form of a capital sum. In the case of permanent partial incapacity, the whole of the pension may be paid in a capital sum to the person concerned where the yearly instalments do not amount to 60 francs. Compensation granted under this Act shall not be transferrable or liable to distraint except in the case of a legal obligation to provide for maintenance.

The worker suffering from an occupational disease in respect of which compensation is due must make his claim in writing to the Insurance Fund accompanied by the requisite documents for establishing his identity, occupation and wage as well as a medical certificate.

Claims for compensation shall be made within the following time limits:

- (1) during the incapacity for work and within one year in case of temporary incapacity;
- (2) during the relapse and within three years in case of the recurrence of a temporary illness which has previously given rise to compensation;
- (3) within five years in case of death or permanent incapacity for work;
- (4) within ten years in case of a claim for revision of the amount of compensation on account of the aggravation or lessening of a permanent infirmity or the death of the person concerned.

All particulars relative to the case are then communicated by the management of the Fund to the chairman of the Technical Committee, who then institutes a medical enquiry undertaken by the officials of the industrial medical service, who get into touch with the medical practitioner in charge of the case and where necessary with the medical practitioner acting for the employer. The result of this enquiry is transmitted, together with the observations of the chairman of the Technical Committee, to the management of the Fund, which then informs the worker of its decision.

Appeals against the decisions of the Fund may be brought before the Justice of the Peace for the canton of domicile of the victim, or that of the Fund in the case of aliens by the worker, his dependants, or even by members of the Technical Committee. If a disease occurs abroad, the territorial jurisdiction of the Justice of the Peace shall be settled as in questions of personal property without prejudice to any provisions laid down in international Conventions. The Justice of the Peace shall give final decisions in cases involving not more than 300 francs, and decisions as a court of first instance irrespective of the amount involved in the claim. Appeals shall be lodged against the Insurance Fund in the form of a summons and costs in respect of these shall be borne by the Fund.

The Insurance Fund is maintained:

- (1) by a Government grant on its establishment;

(2) by contributions levied on the heads of undertakings covered by the Act;

(3) by a special grant from the State in the event of a deficit.

The initial subsidy amounts to 300,000 francs. This sum, as well as those advanced by the State in the case of a deficit, shall be recoverable from the Insurance Fund.

All heads of industrial establishments coming within the Act are obliged to contribute to the insurance fund.

The scale of contributions shall be fixed for the various classes or undertakings by Royal Order. If the Technical Committee so recommends a Royal Order may be issued to grant reductions of premiums to those undertakings which have measures for the protection of their workers. Any head of an undertaking who furnishes proof that his industrial processes no longer involve the use of poisonous substances liable to cause the diseases to which the Act applies shall be exempted by Order of the Minister from payment of contributions. The same exemption may be granted to undertakings which, though using noxious substances, possess an equipment which obviates all danger.

Compensation in the case of occupational diseases is provided by a single Central Fund. Individual responsibility on the part of employers for compensating injuries is replaced by collective responsibility.

Nevertheless, the victim shall retain the right to bring an action for ordinary civil damages against the head of an undertaking if he has intentionally caused the disease, or persons other than the head of the undertaking, his workers or agents, if they are responsible for the occupational disease. An action against a third party thus responsible may even be brought by the Insurance Fund if the victim or his dependants neglect to do so.

Two bodies are responsible for controlling the Fund: the *Governing Body*, which is specially concerned with financial questions, and the *Technical Committee*, which is entrusted with the task of advising the competent Minister regarding the insertion of diseases and processes on the double schedule appended to the Act.

The members of these bodies are appointed by the Government, and constitute in reality joint committees, in which the interests both of employers and workers are represented in equal

proportions: an employer and a worker on the Governing Body, together with a Senator, a Member of the Chamber of Deputies, and an official delegate from the Ministry.

The Technical Committee comprises three heads of establishments, three workers and three medical men specially competent as regards industrial medicine. The Committee is presided over by a member of the medical profession.

The duties of this Committee include recommendations to the competent authority respecting enumeration of the diseases giving rise to compensation and also respecting the assessment of contributions payable by the heads of undertakings. It fulfils the rôle of a consultative body under the Ministry of Industry, Labour and Social Welfare, notably with regard to compensation claims, and effects the requisite medical investigations, possessing in this connection full power of acting in an advisory capacity. The Committee may further engage in studies and enquiries relative to modifications in the schedule of diseases liable to compensation. In conclusion, it engages in research and propaganda relative to rational measures for improved hygiene.

The insurance scheme has up to the present worked very smoothly, for out of about 400 cases dealt with during the first four years by the organisation of the Fund, 357 of which necessitated medical enquiries, only one gave rise to litigation in the courts, and, further, this single case merely consisted in deciding whether the injury should be considered as an industrial accident or an occupational disease.

BOLIVIA

(a) Industrial Accident Compensation Act. Dated 17 January 1924. (*Ley de indemnización de accidentes del trabajo, 17 de enero de 1924.*) (L. S., 1924, Bol. 1.)

(b) Act respecting occupational diseases. Dated 18 April 1928. (*Ley sobre enfermedades profesionales, 18 de abril de 1928.*) (L. S., 1928, Bol. 1.)

(c) Decree of 11 June 1928 respecting occupational diseases. (*Decreto supremo sobre enfermedades profesionales, 11 de junio de 1928.*) (Bol. del Trabajo, julio de 1928, No. 15, p. 310.)

The definition of occupational disease is provided in the Act of 18 April 1928 and the Decree of 11 June 1928, the description being as follows: a disease contracted in the course of an employment or occupation, adding that poisoning and diseases due to the handling of noxious substances or the inhalation of noxious

gases or organic or mineral dust shall also be deemed to be occupational diseases. Further, Article 2 of the Act and Article 1 of the Decree enumerate certain diseases deemed to be occupational, the list comprising:

Pneumoconiosis (miners' phthisis), anthracosis, siderosis, lead poisoning, mercury poisoning, poisoning due to hydrocarbons, phosphorus poisoning, occupational dermatitis, tabacosis, anthrax, pulmonary sclerosis, nephritis, pulmonary tuberculosis and chronic bronchitis.

Occupational disease shall give the right to compensation similar to industrial accidents provided the following conditions are fulfilled:

- (a) that the disease was contracted by the worker in the course of his trade or occupation. This shall be proved by medical examination stating the condition of health of the worker prior to his entry on employment;
- (b) that the disease was caused by the kind of employment in which he was engaged during the year preceding commencement of incapacity;
- (c) that the worker did not suffer from the disease before entering the employment which he has been compelled to leave.

BRAZIL

(a) Decree No. 3724 respecting liability for industrial accidents. Dated 15 January 1919. (*Decreto no. 3724 de 15 Janeiro de 1919 sobre as obrigações resultantes dos accidentes no trabalho.*) (L. S., 1920, Braz. 1-2.)

(b) Decree No. 13499 confirming the administrative regulations under the Act of 15 January 1919. Dated 12 March 1919. (*Decreto n. 13499 de 12 de Março de 1919, approva o regulmento para execução da lei n. 31724 de 15 de janeiro de 1919 sobre as obrigações resultantes dos accidentes no trabalho.*) (L. S., 1920, Braz. 1-2.)

The Act of 16 January 1919 assimilates to industrial accidents diseases contracted exclusively during the course of employment in cases where the said employment is of such a nature as in itself to produce the said diseases, and where the death of the worker or his total or partial, permanent or temporary loss of capacity for work ensues therefrom.

The administrative regulations under the Act enumerate as follows the diseases to be considered as occupational:

Poisoning by lead, mercury, copper, phosphorus, arsenic and its compounds, pneumoconiosis, tabacosis, ophthalmia due to ammonia, poisoning by carbon bisulphide or poisoning due to hydrocarbons.

BULGARIA

(a) Act respecting social insurance. (*Ukase No. 7*). Dated 6 March 1924. (*Zakone za obchtestvénité osigourovki. 6 mart 1924.*) (*L. S.*, 1924, Bulg. 1.)

(b) Administrative regulations of 25 June 1924 under the Act of 6 March 1924 respecting social insurance. (*Ukaze no. 26: Pravilnike za prilojenie na Zakona za obchtestvénité osigourovki. 25 Junie 1924.*)

The Act of 6 March 1924 does not define occupational disease. On the other hand, a definition is given in the regulations of 25 June 1924 which, apart from the description of accidents considered as sudden injuries independent of the will of the victim, describes occupational diseases as affections preventing the worker or employee from attending his work at least during one day. Further, there should be deemed as occupational diseases those which are due to more or less extensive working experience and are the result of special conditions under which workers are engaged in a certain establishment. A list of these diseases appended to the regulations is divided in three columns: the first contains an enumeration of the occupations in which the victims of occupational diseases may be employed; the second enumerates the diseases, and the third the causes liable to engender such diseases. The affections are grouped under seven heads:

- 1, skin diseases; 2, diseases of the respiratory system;
- 3, diseases of the circulatory and digestive systems; 4, eye diseases; 5, ear diseases; 6, forms of poisoning; 7, diseases caused by microbes and parasites.

The first category contains eczema, erysipelas, callosities, ulceration, etc.; the second, chalicosis, siderosis, anthracosis, byssinosis, silicosis, pulmonary tuberculosis, uncomplicated or chronic bronchitis, laryngitis, pneumonia; the third group includes digestive derangements, constipation, haemorrhoids, varicose veins, thoracic deformation, palor, anaemia, carbon-monoxide poisoning; the fourth includes conjunctivitis, blepharitis, keratitis, retinitis, myophthalmia, and nystagmus; the fifth, deafness; the sixth, poisoning by lead, mercury, arsenic, hydrocarbons and carbon-bisulphide; and finally, the seventh group contains ankylostomiasis, anthrax, syphilis, glanders, tuberculosis and other infectious diseases.

All these diseases assume an occupational aspect when affecting a worker engaged in one of the occupations inscribed

in the first column and due to a cause mentioned in the third column of the list.

Thus, for example, eczema when affecting blacksmiths, bakers, glaziers or pastrycooks, etc., and due to high temperature; anthracosis when affecting miners or iron foundry workers and due to coal dust; varicose veins affecting waiters or cellarmen and due to constant standing; keratitis when occurring amongst workers in explosive factories due to nitrous fumes or carbon monoxide; deafness in the case of coppersmiths, blacksmiths, mechanics, etc., due to noise; lead poisoning when occurring amongst lead miners, slaters, file cutters, printers, etc., when due to the action of lead or its compounds; syphilis amongst glass blowers due to infection from the blowing pipes; infectious diseases when occurring amongst medical staff in contact with patients, infected instruments, etc.

CANADA

Alberta

(a) The Workmen's Compensation Act (Accident Fund) 1918, c. 5. s. 1. Revised Statutes of Alberta 1922, ch. 177, with amendments. (*Labour Legislation in Canada*, 1928, pp. 519 et seq.)

The definition of industrial disease provided in the Act of 1918 (Section 2, (j)), describes as such any of the diseases mentioned in an appended list and any other disease which by the regulations shall be declared to be an industrial disease. The list is as follows:

Description of disease	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Glanders.	Care of equine animals suffering from glanders; handling of carcasses of such animals.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.

Description of disease	Description of process
Infection or inflammation of the skin or contact surfaces due to oils, cutting compounds or lubricants, dust, liquids, fumes, gases or vapours.	Any industrial process involving the handling or use of oils, cutting compounds or lubricants or involving contact with dust, liquids, fumes, gases or vapours.
Pneumoconiosis, which shall be deemed to be: Silicosis, Siderosis, Lithosis.	Quarrying, cutting, crushing, grinding or polishing of stone, or grinding or polishing of metal; mining.
Poisoning by benzol or by nitro, and amido derivatives of benzol, anilin and others.	Any industrial process involving the use of benzol or a nitro- or anilin-derivative of benzol or its preparations or compounds. (Sic.)
Subcutaneous cellulitis of the hand (beat hand).	Mining or other industries which require continued use of hand tools.

A section of the Act adds that where the workman was, at or immediately before the date of disablement, employed on any process mentioned in the second column of the schedule of industrial diseases and the disease contracted is the disease in the first column of the said schedule set opposite to the description of such process, the disease shall be deemed to have been due to the nature of employment unless the contrary is proved.

Conditions of *notification* are similar to those for industrial accidents, but in the case of an industrial disease the Board constituted to administer the Act may require every physician treating a patient suffering from an industrial disease to report to the Board such information as it may require and the victim of such a disease suffering from an affection in the schedule caused by the nature of his occupation during the twelve months preceding disablement enjoys the same rights as the victim of an accident.

Nothing in this section affects his rights to compensation in respect of any disease to which the Act does not apply.

The Board may prescribe medical treatment according to circumstances. When such is not the case the Board may as it deems necessary require an employer to retain from the wages earned by the workers in his employment the sum necessary for defraying the cost of medical aid.

British Columbia

(a) Workmen's Compensation Act 1916, c. 77. s. 1. Revised Statutes of British Columbia, ch. 278c, with amendments. (*Labour Legislation in Canada*, pp. 667 et seq.)

The definition of industrial disease given in the Act of 1916 on accidents describes such disease as any of the diseases mentioned in the schedule which is as follows:

Description of disease	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Ankylostomiasis.	Mining.
Subcutaneous cellulitis of the hand (beat hand).	Mining.
Subcutaneous cellulitis of the patella (miner's beat knee).	Mining.
Acute bursitis over elbow (miners' beat elbow).	Mining.
Inflammation or ulceration of skin or mucous membrane by sulphur or sulphur gases.	Mining.
Poisoning by nitro or amido derivatives of benzene and its homologues (trinitrotoluene, anilin and others) or its sequelae.	Any process in the manufacture or involving the use of any nitro or amido derivative of benzene or any of its homologues.
Poisoning from a wound by <i>Juniperus Virginiana</i> (Red Cedar) producing dermatitis.	Lumbering or manufacturing.
Compressed air illness and its sequelae.	Any process carried on in compressed air.
Acute dermatitis due to irritation from cement.	Cement work.

In the absence of proof to the contrary the Act deems as suffering from industrial disease any worker who at the moment of or immediately before the occurrence of disability has been engaged in one of the processes mentioned in the second column of the schedule and is suffering from one the diseases corresponding thereto in the first column.

Provisions relative to *notification* are similar to those for industrial accidents, but in the case of an industrial disease the Board constituted to administer the Act may demand requisite information from any physician attending a patient suffering

from an industrial disease. Industrial diseases are dealt with similarly to industrial accidents wherever it is a case of disability contracted in the course of employment within the twelve months preceding the date of disability due to the said disease.

Nothing in this section of the law dealing with industrial disease shall affect the right of a worker to compensation in respect of a disease to which this section does not apply.

Manitoba

(a) The Workmen's Compensation Act 1920, c. 159. s. 1. Statutes of Manitoba, Consolidated Amendments 1921, ch. 209, with amendments. (*Labour Legislation in Canada*, 1928, pp. 439 et seq.)

(b) Act to amend the Workmen's Compensation Act. Assented to 8 April 1930. (*Ibid.*, 1930, pp. 42 et seq.)

The definition of industrial disease provided in the Act on industrial diseases describes as such any of the diseases mentioned in the appended schedule and any other disease which by the regulations shall be declared to be an industrial disease. The schedule is as follows:

Description of disease	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Ankylostomiasis.	Mining.

The Act of 8 April 1930 makes the following additions to this list:

Conjunctivitis and retinitis.	Electro- and oxy- acetylene welding.
Occupational dermatitis and occupational ulcerations and infections of the skin caused by harmful and noxious factors pertaining specifically to the employment carried on by workers mentioned in the second column.	Abattoir and stockyard workers; boiler washers (steam); bricklayers; cement (Portland) workers; dyers (in clothes-cleaning establishments); furriers and fur workers; laundry workers; lime workers; masons; metal platers (including galvanizers and bronzers); plasterers (including lime white-washers); painters (including paint mixers and French polishers); printers (including engravers, electrotypers and lithographers); tanners (leather; including hide workers).

Any worker in any of the classes defined above suffering from occupational dermatitis, ulcerations or affections of the skin, and who has become disabled for work thereby, or who has required medical or surgical attention for the cure of such skin affection on three separate occasions or periods shall, after the lapse of twelve months from the date of the beginning of such first period of disability or treatment, be deemed unfit for the special class of employment in which he is then engaged, and no further similar claim for disability or medical treatment or other benefit may be made by such affected worker so long as he remains engaged in such harmful occupation.

In default of proof to the contrary, a worker is considered as suffering from an occupational disease under the Act when at the time of disability or immediately prior thereto, he has been engaged in one of the industrial processes mentioned in the second column of the schedule and is suffering from one of the corresponding diseases indicated in the first column. Apart from provisions relative to notification, which are similar to those applicable in the case of accidents the Board may by regulation require every physician treating a patient suffering from any industrial disease to report to it such information relating thereto as it may require. Victims of an industrial disease enjoy the same rights as those of industrial accidents. Nevertheless, except where the Board is satisfied that the disease is not due to any other cause than his employment in Manitoba, no compensation is payable unless the workman has been a resident of Manitoba for the three years preceding his first disability.

As regards payment of benefits, industrial diseases are assimilated to industrial accidents wherever it is a case of a disease contracted in the course of employment within the twelve months preceding disablement from such disease.

Nothing in this section of the law dealing with industrial disease shall affect the right of the workmen to compensation in respect of any injury to which this section does not apply.

New Brunswick

(a) The Workmen's Compensation Act, 1918, c. 37. s. 1. Revised Statutes of New Brunswick, 1927, ch. 157. (*Labour Legislation in Canada*, 1928, et seq.)

(b) Regulation under the Workmen's Compensation Act, 15 December 1932. (*The Labour Gazette*, January 1933, p. 40.)

The definition of "industrial diseases" is provided in the Act on Workmen's Compensation, which describes as such any disease which, by the Regulations, is declared to be an industrial disease.

The Regulations of 15 December 1932 contain the following list of industrial diseases.

Description of disease or injury	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Sulphur poisoning or its sequelae.	Any process involving the use of sulphur or its preparations or compounds.
Ammonia poisoning or its sequelae.	Any process involving the use of ammonia or its preparations or compounds.
Carbon bisulphide or its sequelae.	Use of carbon bisulphide.
Carbonic acid gas.	Use of carbonic acid gas.
Ankylostomiasis.	Mining.
Glanders.	Care of any equine animal suffering from glanders; handling the carcass of any such animal.
Compressed air illness.	Any process carried on in compressed air.
Infection by handling sugar.	Any process involving the refining of sugar.

Industrial diseases are assimilated to accidents for the purpose of benefits wherever the disease in question is a disease contracted during employment within the twelve months preceding the date of disablement due to the said disease.

Nothing in this section of the Act shall affect the right of a workman to compensation in respect of a disease to which this section does not apply.

Nova Scotia

(a) The Workmen's Compensation Act, 1915, c. 1. s. 1. Revised Statutes of Nova Scotia, 1923, ch. 129, with amendment. (*Labour Legislation in Canada*, 1929, pp. 113 et seq.)

The definition of “industrial diseases” provided by the Act on Workmen’s Compensation describes as such any of the diseases mentioned in the schedule and any other disease which, by the Regulations, is declared to be an industrial disease. The schedule to the Act contains the following list:

Description of disease or injury	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Ankylostomiasis.	Mining.
Subcutaneous cellulitis of the hand (beat hand).	Mining.
Subcutaneous cellulitis over the patella (miners’ beat knee).	Mining.
Acute bursitis over the elbow (miners’ beat elbow).	Mining.
Frostbite.	Any outdoor work.

In default of proof to the contrary, any worker who, at or immediately before the date of occurrence of disablement, was employed in any process mentioned in the second column of the schedule, and has contracted a disease corresponding to such process in the first column of the schedule, is considered to be suffering from an industrial disease within the meaning of the Act.

This part of the Act shall not apply to farm labourers or domestic or menial servants. The Board may, however, upon application by an employer, admit the industry in which such labourers or servants are employed, with the result that they are entitled to benefit by the provisions of this part of the Act and by Regulations made by the Board.

Industrial diseases are assimilated to accidents in the case of disablement contracted within twelve months previous to notification of the disease. Nothing in this section of the Act affects the right of a workman to compensation in respect of a disease to which this section does not apply.

Ontario

(a) Workmen's Compensation Act, 1914. Revised Statutes of Ontario, 1927, ch. 179, with amendments. (*Labour Legislation in Canada*, amended 1928, pp. 318 et seq.)

(b) Regulation No. 94 made by the Workmen's Compensation Board pursuant to the provisions of the Workmen's Compensation Act, 13 January 1925. (*The W.C.A., Ontario, with amendments to 1926, and Regulations of Board etc. consolidated 1926*, p. 75.)

(c) Amendment of Regulation No. 94 approved 1 June 1928. (*The W.C.A., Ontario, with amendments to 1926, and Regulations of Board etc. consolidated 1926*, p. 75.)

(d) Regulation No. 96, under the Workmen's Compensation Act, declaring "compressed air illness" to be an industrial disease. Dated 1 October 1926. (*The Labour Gazette*, 1926, No. 11, p. 1079.)

(e) Regulation No. 99 made by the Workmen's Compensation Board pursuant to the provisions of the Workmen's Compensation Act, 5 June 1929. (*The Ontario Gazette*, 1929, No. 26, p. 838.)

(f) An Act to amend the Workmen's Compensation Act, assented to 29 May 1932. (*Statutes of Ontario*, 1932, p. 50.)

(g) An Act to amend the Workmen's Compensation Act. Assented to 18 April 1933. (23 Geo. V, 1933, ch. 70.)

The definition of "industrial disease" given in the Act on Workmen's Compensation, describes as such any of the diseases mentioned in the schedule and any other disease which by the Regulations is declared to be an industrial disease. At the present time the schedule to the Act of 1914 and the various supplementary provisions in the Act of 1932, together with numerous later Regulations adopted, provide the following list of diseases:

Description of disease or injury	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Ankylostomiasis.	Mining.
Benzol poisoning.	Use of benzol.
Stoneworkers' or grinders' phthisis.	Quarrying, cutting, crushing, grinding or polishing of stone, or grinding or polishing of metal.

Description of disease or injury	Description of process
Silicosis ¹ .	Mining.
Pneumoconiosis.	Quarrying, cutting, crushing, grinding or polishing of stone, or grinding or polishing of metal.
Compressed air illness or caisson disease.	Any process carried on in compressed air.
Poisoning by chrome and its compounds.	Any process involving the use of chrome or its compounds.
Bursitis.	Any process involving continuous rubbing, pressure or vibration of the parts affected.
Cancer.	Arising from the manufacture of pitch and tar.
Dermatitis (venenata).	Any process involving the use of or direct contact with acids and alkalis or acids and oils capable of causing dermatitis (venenata).
Infected blisters.	Any process involving continued friction, rubbing or vibration, causing blisters or abrasions.

In default of proof to the contrary, any worker who, at or immediately before the date of disablement, was employed in any process mentioned in the second column of the schedule, has contracted a disease corresponding to such process in the first column of the schedule, is considered to be suffering from an industrial disease within the meaning of the Act.

The victim enjoys the same rights as the victim of an industrial accident, but, except where the Board is satisfied that the disease is not due to any other cause than his employment within Ontario, no compensation shall be payable under this

¹ "Silicosis" means a fibrotic condition of the lungs caused by the inhalation of silica dust, sufficient to produce a lessened capacity for work. "Tuberculosis" means tuberculosis of the lungs when on examination of any person tubercle bacillus is found in the sputum of such person, or such person has active tuberculosis, shown by clinical and physical findings, to such a degree as to impair seriously his capacity for work.

Formerly legislation took into account three distinct stages of silicosis, but in virtue of the amendment of 18 April 1933 this distinction has been suppressed, and compensation is paid when silicosis or tuberculosis are present with partial or total disability. When silicosis and tuberculosis are present, payment of compensation is based upon 50 per cent. of the workman's average earning, rather than upon 66 per cent. and $\frac{2}{3}$ of his average earnings as obtains in the case of accident and the other occupational diseases. When uncomplicated silicosis is present, the basis of payment remains the same as for other occupational diseases.

Provisions of the section relating to silicosis apply also to pneumoconiosis, and stoneworkers' or grinders' phthisis contracted during the course of employment in any of the processes in which such disease is compensable (amendment of 18 April 1933).

section unless the workman has been a resident of Ontario for the three years next preceding his first disablement ¹.

Where compensation is payable out of the accident fund, the Board shall make such investigation as it deems necessary to ascertain the class or classes against which the compensation should be charged.

The compensation payable to a worker suffering from disease is similar to that payable in the case of industrial accidents, and shall be fixed with reference to the earnings of the worker under the employer in whose service he has contracted the disease. Where no compensation funds exist, compensation is recoverable from the last employer who gave employment to the victim of industrial disease. If the latter alleges that the disease was contracted while the workman was in the employment of some other employer, he may bring such employer before the Board for accident compensation, and, if the allegation is proved, can render him responsible for the payment of compensation. If the disease is of such a nature as to be contracted by gradual process, and if the victim has been employed during the twelve months preceding disablement by several employers, such employers shall be jointly responsible, and shall share the cost of compensation in proportions to be established by the Board for accident compensation.

Nothing in this section of the Act shall affect the right of a workman to compensation in respect of a disease to which this section does not apply.

Quebec

Workmen's Compensation Act, 1931. 21 Geo V., ch. 100. Assented to 4 April 1931. (*L. S.*, 1931, Can. 7.)

The definition of "industrial disease" given in Article 105 of the Act of 4 April 1931 assimilates such disease to a bodily injury by accident when the worker suffers disablement which prevents him earning his full salary at the work on which he was employed or in case of death, provided that the disease in question is due to the nature of the work effected for one or several employers in the course of the twelve months preceding the date of disablement.

¹ For silicosis, however, compensation is only granted when the worker has been effectively exposed to silica dust during the course of his occupation during a total period of at least five years.

A schedule to the Act provides the list of diseases covered and of the processes in which they must occur in order to establish their occupational character. The schedule is as follows:

Description of disease	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Benzol poisoning.	Any process involving the use of benzol.
Compressed air illness or caisson disease.	Any process carried on in compressed air.
Chrome poisoning.	Any process involving the use of chromium or its compounds.

If the workman at, or immediately before, the date of disablement was employed in any process mentioned in the second column of the schedule and the disease contracted is a disease in the first column of the schedule set opposite to the description of the process, the disease shall be deemed to have been due to the nature of that process unless the contrary is proved. No compensation shall be payable, however, under this section unless the workman has been continuously resident in the province for the three years next preceding his first disablement, except in the case where the Commission is satisfied that the disease is not due to any other cause than his employment within the province.

Section 1 of the Act describes "industrial" disease as any disease mentioned in the schedule and any other disease which by regulations is declared to be an industrial disease.

In the absence of an accident fund, and where the compensation is payable by an employer individually, it is recoverable from the employer who, during the twelve months preceding disablement, has last employed the worker on work during the course of which the disease has occurred. The worker and his dependants, if so required, shall furnish the employer with such

information as they possess concerning the names and addresses of any other employers for whom the worker has worked during the preceding twelve months. If the last employer alleges that the disease was in fact contracted while the worker was in the service of another employer, he may bring such employer before the Commission, and if the allegation is proved the Commission may order the latter to pay compensation. If the disease is such as to be contracted and to develop gradually, all the other employers who during the preceding twelve months employed the workman on work of a nature to produce the disease shall be liable to pay to the employer from whom compensation is recoverable such proportion or contribution as the Commission may determine to be just. The amount of compensation shall be fixed with reference to the earnings of the workman under the employer by whom compensation is payable.

Saskatchewan

The Workmen's Compensation (Accident Fund) Act, 1928-1929, c. 73, s. 1. Labour Laws of Saskatchewan, 1930. (*Labour Legislation in Canada*, 1930, pp. 97 et seq.)

The definition of "industrial disease" is given in the Act of 1929. These diseases are assimilated to accidents and are to be found in the schedule appended to the Act, which contains the following:

Description of disease	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Ankylostomiasis.	Mining.
Miners' phthisis.	Mining.
Benzol poisoning.	Any process involving the use of benzol.
Stone workers' or grinders' phthisis.	Quarrying, cutting, crushing, grinding, or polishing of stone; or grinding or polishing of metals.
Silicosis.	Mining.

Description of disease	Description of process
Pneumoconiosis.	Quarrying, cutting, crushing, grinding or polishing of stone; or grinding or polishing of metals.
Compressed air illness or caisson disease.	Any process carried on in compressed air.

“Silicosis ” means fibrosis of the lungs caused by the inhalation of silica dust. Three stages of the disease are distinguished; ante-primary, when it is found that the earliest detectable, specific, physical signs of silicosis are or have been present, whether or not capacity for work is or has been impaired by such silicosis; primary, when it is found that definite and specific signs of silicosis are or have been present, and that capacity for work is or has been impaired by that disease, though not seriously and permanently; secondary, when it is found that definite and specific physical signs of silicosis are, or have been, present, and that capacity for work is, or has been, seriously and permanently impaired by that disease, or when it is found that tuberculosis with silicosis is or has been present.

“Tuberculosis ” means tuberculosis of the respiratory organs when on examination of any person it is found that such person expectorates the tubercle bacillus; or such person has closed tuberculosis to such a degree as to impair seriously his working capacity, and to render prohibition of his working underground advisable in the interest of his health.

Where a workman, during the twelve months preceding disablement, suffers from or dies from a disease inscribed in the schedule, and such disease is due to the nature of his employment, he or his dependants are entitled to compensation.

Nothing in this section shall affect the right of a workman to compensation in respect of a disease to which this section does not apply.

If the workman at, or immediately before, the date of disablement was employed in any process mentioned in the second column of schedule 2 and the disease contracted is a disease in the first column of the schedule set opposite to the description of the process, the disease shall be deemed to have been due to the nature of the employment unless the contrary is proved, but except where the Board is satisfied that the disease is not due to any other cause than his employment within Saskatchewan no compensation shall be payable under this section unless the

worker has been resident in Saskatchewan for the three years next preceding his first disablement¹.

The amount of compensation shall be fixed with reference to the earnings of the workman under the employer by whom the compensation is payable.

CHILE

(a) Legislative Decree No. 379. Final text of the Accident Compensation Act (No. 4055 of 8 September 1924). Dated 18 March 1925. (*Decreto-ley num. 379 (Texto definitivo de la ley no. 4055 de 8 de Septiembre de 1924 de accidentes del trabajo.) 18 de marzo de 1925.*) (L. S., 1925, Chil. 4.)

(b) Decree No. 581 (to approve the Regulations for the administration of section 3 (Occupational Diseases) of Act No. 4055, respecting accident compensation). Dated 21 April 1927. (*Decreto num. 581 (apruebase el Reglamento para la aplicacion del articulo 3 de la ley 4055 sobre accidentes del trabajo). 21 de abril de 1927.*) (L. S., 1927, Chil. 2.)

The Act of 1925 defines as "occupational diseases" those diseases which are directly caused by the exercise of the trade or occupation carried on by the wage-earning or salaried employee and which incapacitate him for work.

A special regulation contains the occupational diseases to which this definition applies. This regulation in its turn assimilates diseases contracted during the exercise of the trade or occupation to industrial accidents. The list of diseases is as follows:

Poisoning

Lead poisoning, mercury poisoning, arsenic poisoning, various forms of industrial poisoning; poisoning by copper, antimony, zinc, chromium, barium, manganese, bronze, gold, silver and tin; poisoning by hydrocarbons and carbon bisulphide.

Diseases

Diseases caused by infectious agents (parasitic and infectious diseases): anthrax, carbuncles, glanders, actinomycosis, tetanus, ankylostomiasis; diseases caused by the inhalation of dust, gases and fumes; pneumoconiosis; irritating gases and fumes; diseases caused by compressed air and the sequelae thereof.

Industrial poisoning by toxic gases; toxic fumes from essences and resins; toxic fumes from tar and its derivatives; subcutaneous cellulitis of the hands (mines); subcutaneous cellulitis of the knee (mines); acute synovitis of the elbow (mines); inflammation of the tendon sheaths of the wrists (mines); glassworkers' cataract; telegraphists' cramp; miners' nystagmus; occupational diseases of the bones, muscles and tendons; occupational neuroses; occupational diseases of the skin.

Occupational alcoholism and nicotine poisoning in the case of workers employed in the industries concerned.

The Regulations of 1927 require that the disease must have been declared to be due to the nature of the work performed by the victim or the conditions under which he has performed his work during the year preceding the appearance of the disease.

¹ For silicosis the restriction is identical to that in force in Ontario, cf. note p. 98.

In general, for occupational diseases conditions are similar to those relative to industrial accidents. If any difficulty arises in deciding whether a case is an accident properly so called or an occupational disease, any incapacity brought about in a sudden or violent manner shall be deemed to be due to an accident, and any incapacity brought about gradually during a period to be estimated approximately by the medical practitioner attending the victim or the medical officer of the General Directorate of Labour shall be deemed to be due to an occupational disease. The Regulations contain a clause to the effect that the employer may discharge his liabilities under these Regulations by insuring against the risk of occupational disease with an industrial accident insurance company. As a general rule compensation shall be recoverable from the employer in whose service the victim was employed during the year preceding the appearance of the disease.

COSTA RICA

(a) Act No. 53 respecting compensation for industrial accidents. Dated 31 January 1925. (*Ley no. 53 sobre reparacion por accidentes del trabajo. 31 de enero de 1925.*) (L. S., 1925, C.R. 1.)

(b) Act No. 92, to amend Act No. 53 of 31 January 1925, respecting compensation for industrial accidents. Dated 24 August 1926. (*Ley no. 92, de 24 de agosto de 1926, modificando la ley no. 53 de 31 enero de 1925 sobre reparacion por accidentes del trabajo.*) (L. S., 1926, C.R. 1.)

(c) Act No. 34 of 3 February 1931, to amend Act No. 53 of 31 January 1925, respecting compensation for industrial accidents. (*Ley no. 34, de 3 febrero de 1931 reformando la ley no. 53 de 31 enero de 1925 sobre reparacion por accidentes del trabajo.*) (L. S., 1931, C.R. 1.)

The Act of 31 January 1925, amended by the Act of 3 February 1931, describes "accidents" as any bodily injury suffered by the worker which arises out of or in the course of work which he performs on account of another and also any illness contracted as the immediate, direct and indubitable result of such work.

CUBA

(a) Act of 12 June 1916, relative to compensation for industrial accidents. (*Ley de 12 de junio de 1916: accidentes del trabajo.*) (*Legislacion Social y del Trabajo Vigente en Cuba, 1927, p. 119.*)

(b) Decree No. 1688 of 28 October 1917, in administration of the Act of 12 June 1916 relative to compensation for industrial accidents. (*Decreto no. 1688 de 26 de octubre de 1917: Reglamento de aplicacion de la ley sobre accidentes del trabajo.*) (*Legislacion Social y del Trabajo Vigente en Cuba, 1927, p. 133.*)

Without providing a special definition of "occupational diseases", the Act on industrial accidents comprises under the latter "all bodily injuries" from which the worker suffers during or as a result of work effected on account of another.

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CZECHOSLOVAKIA

(a) Act of 28 December 1887 on accident insurance and subsequent amendments. (*Zakon z 28. prosince 1887, c. 1 r. z. na rok 1888, o urazovém pojištění delníku etc.*) (*Šmidek Sbirka Zákonův a nařízení etc. v. Praze 1924.*)

(b) Act XIX/1907 on workmen's compensation in industry and commerce for diseases and accidents and subsequent amendments. (*Zakonny, cl. XIX/1907 o pojištění průmyslových a obchodních zaměstnanců pro případ nemoci a úrazů etc.*) (*Smidek Sbirka Zákonův etc. v. Praze 1924.*)

(c) Act. No. XVI/1900 on the insurance fund for agricultural workers and subsequent amendments. (*Zákonný cl. XVI z. r. 1900 o Pomocné pokladnici pro zemědělské dělníky a čeled etc.*) (*Smidek Sbirka Zákonův etc. v. Praze 1924.*)

(d) Act of 1 June 1932 on compensation for occupational diseases. (*Zakon Zedne 1 června 1932 o odškodnění nemoci z povolání no. 99.*) (*L. S., 1932, Czech. 1.*)

According to paragraph 2 of the Act of 1 June 1932 occupational diseases compensated are enumerated in the schedule appended to the Act, which is as follows:

Diseases	Establishments insured against accidents
Diseases due to lead and its compounds.	All establishments in which the substances mentioned in the first column are produced, transformed or utilised, or are met with as accessory products.
Diseases due to phosphorus and its compounds.	
Diseases due to mercury and its compounds.	
Diseases due to arsenic.	
Diseases due to manganese.	
Diseases due to benzene, its homologues and nitro and amido derivatives of the aromatic series.	
Diseases due to carbon disulphide.	
Diseases due to sulphuretted hydrogen.	
Diseases due to war gas, that is to say, phosgene, thio, etc.	
Diseases due to carbon monoxide.	
Diseases due to hydro-cyanic acid, or its derivatives such as calcium cyanamide.	
Diseases due to the prolonged action of X-rays, of radium or its emanations.	
Serious and persistent eczema (cancer) due to soot, paraffin, tar, creosote, anthracene or pitch and similar substances, as well as the sequelae of such forms of eczema (or of cancer).	

Diseases	Establishments insured against accidents
Cancer of the lungs due to radium rays or emanations.	Uranium mines and factories making uranium colours, radium and preparations of radium (for instance Jachimov).
Anthrax.	(a) Care of animals, slaughtering, utilisation or destruction of carcasses or animal debris likely to be contaminated with anthrax. (b) Manipulation of wool, hair, bristles, hides and skins, or selling or transport of such objects.
Infectious diseases.	Hospitals.
Glanders.	Any work involving exposure to this risk.
Diseases of the muscles, bones or joints amongst workers using drills, hammers, pneumatic riveting machines and other similar apparatus.	Establishments where such machines or pneumatic apparatus are used.
Ankylostomiasis.	Mines.
Diseases of the deeper respiratory passages due to the action of basic slag.	Manipulation and transport of basic slag.
Serious pneumoconiosis due to quartz and iron dust. In cases of serious pneumoconiosis with pulmonary tuberculosis, tuberculosis is compensated as a disease due to dust.	(a) Extraction, manipulation and transformation of sandstone. (b) Manufacture of pottery. (c) Polishing of metals. (d) Mining, where hard quartz is present.
Diseases due to chrome compounds.	Establishments in which these compounds are utilised.
Deafness or hardness of hearing approaching deafness due to noise or shocks.	Metallurgical factories.
Serious cataract.	Glassworks, metallurgical works and foundries.
Serious and complicated forms of nystagmus.	Mines.

Paragraph 7 of the Act makes provision for modification and completion of this schedule by means of a Government Order.

The provisions of the Act are valid for all establishments and processes coming within the scope of accident insurance.

Paragraph 4 of the Act provides for compulsory notification of occupational diseases to be made to the sickness insurance institutions. Further, a Government Order may be issued making such notification compulsory for any medical practitioner who meets with a case of occupational disease.

Occupational disease is assimilated to an injury due to accident, and death following disease of occupational origin to death by accident.

The commencement of a disease is considered as the date of the accident in accordance with the Sickness Insurance Act. Where it would be to the advantage of the insured worker, or, again, in the case of a worker not belonging to the sickness insurance scheme, the moment at which incapacity for work occurs shall be considered as the commencement of the disease.

Compensation for workers coming within the sickness insurance scheme consists in an allowance which is granted to the victims of occupational disease which is prolonged in the case of victims of an occupational disease after the 27th week from the beginning of the disease or of incapacity for work, the first twenty six weeks being compensated by the scheme.

Where there is any risk of the occupational disease recurring or becoming aggravated should the worker continue to follow his occupation, the insurance institution may grant him a transition allowance, which shall not, however, at most exceed 50 per cent. of the total allowance. Receipt of this supplementary allowance shall in no wise prejudice the rights of a patient to the total allowance.

The victim of an occupational disease who has not from the outset obtained compensation is still entitled to claim it during a period of one year from the date on which his occupational disease has been recognised by his physician, or at latest within two years from the date on which he was obliged to give up his occupation. Dependants are required to lodge their claims within a year from the date of death.

DANZIG

(a) Insurance Code (*Versicherungsordnung*). (See Germany, paragraph (a)).

(b) Order to extend accident insurance to cover occupational diseases due to industrial employment. Dated 22 February 1929. (*Verordnung zur Ausdehnung der Unfallversicherung auf gewerbliche Berufskrankheiten* vom 22. Februar 1929.) (*L. S.*, 1929, *Danz.* 2.)

The Order of 22 February 1929 assimilates certain occupational diseases to accidents for the purposes of compensation. These diseases are defined in a schedule which is as follows:

Occupational disease due to industrial employment

Establishments liable to insurance against the diseases specified in the opposite column.

Diseases caused by lead or its compounds.

Diseases caused by phosphorus.

Diseases caused by mercury or its compounds.

Diseases caused by arsenic or its compounds.

Diseases caused by benzol or its homologues.

Diseases caused by nitro and amido compounds of the aromatic group.

Diseases caused by carbon disulphide.

Epithelial cancer caused by soot, paraffin, tar, anthracene, pitch and similar substances.

Glassworkers' cataract.

Diseases caused by X-rays and other forms of radiant energy.

Establishments in which insured persons are habitually exposed to the effects of the substances specified in the opposite column.

Glass works.

Establishments in which insured persons are exposed to the effects of X-rays or other forms of radiant energy.

The schedule likewise defines the field of application of the Act. An article in the Act states that only those occupational diseases included in the schedule are covered by insurance and only then when the disease is caused by employment in an establishment liable to industrial accident insurance.

Another article of the Act provides for compensation when the disease is the result of an occupation in an establishment liable to insurance against the disease in question.

The beginning of the sickness within the meaning of the sickness insurance provisions shall be deemed to be the date of the accident. If there is reason to fear that an occupational disease due to industrial employment would occur, recur, or be aggravated if the insured person continues to be employed in an establishment liable to insurance against the disease, the insurance carrier may grant the said insured person a transference pension amounting to not more than one-half the full pension for so long as he refrains from employment in such establishment.

Notification of occupational disease by any medical man treating a case is compulsory as in the case of accidents. The medical practitioner is entitled to a fee in respect of the notification. The accident association shall cause every sick person to be examined by a medical practitioner. The local insurance

office may impose a disciplinary fine on any medical practitioner who fails to notify a case of disease in due time.

It shall in agreement with the Factory Medical Inspectorate and the accident association, lay down rules as regards the diseases which are to be deemed occupational diseases due to industrial employment within the meaning of the schedule.

DENMARK

Act No. 183 respecting insurance against the consequences of accidents. Dated 20 May 1933. (*Lov om Forsikring mod Folger af Ulykkestilfaelde. Nr. 183. Den 20. Maj 1933.*) (*Socialt Tidsskrift*, Vol. IX, No. 4, April 1933, p. 13181.) (*L. S.*, 1933, Den. 5.)

The 1923 Act assimilates to accidents for the purpose of compensation a number of occupational diseases specified in a schedule. If one of the diseases specified in this schedule is found to be present in an insured person employed in one of the processes indicated in the schedule opposite the disease in question, and if it may reasonably be assumed that the disease is due to his employment in the said undertaking, the disease and the consequences thereof shall entitle him to compensation under the Act.

The schedule is as follows:

Diseases	Processes
Poisoning by lead, its alloys or compounds and their sequelae.	Handling of ore containing lead, including residues containing lead in zinc factories.
	Casting of old zinc and lead in ingots.
	Manufacture of articles made of cast lead or of lead alloys.
	Employment in the polygraphic industries.
	Manufacture of lead compounds.
	Manufacture and repair of electric accumulators.
	Preparation and use of enamels containing lead.
	Polishing by means of lead filings or putty powder with a lead content.
	All painting operations involving the preparation and manipulation of coating substances, cements or colouring substances containing lead pigments.

Diseases	Processes
Poisoning by mercury, its amalgams and compounds and their sequelae.	Handling of mercury ore. Manufacture of mercury compounds. Manufacture of measuring and laboratory apparatus. Preparation of raw material for the hat-making industry. Hot gilding. Use of mercury pumps in the manufacture of incandescent lamps. Manufacture of fulminate of mercury primers. Work in connection with animals infected with anthrax.
Anthrax infection.	Handling of carcasses of such animals, including hides, hoofs and horns. Loading and unloading or transport of merchandise.
Chronic and chronically recurrent dermatitis caused by foreign woods.	Any undertaking or employment liable to accident insurance. Manufacture of cleaning powders. Porcelain and ceramic industries. Stone industry.
Diseases of the lungs caused by the inhalation of stone dust and mineral substances.	Certain branches of the metal industry (grinding, sandblasting, moulding, cleaning). Cement industry. Brick and tile works. Millstone industry.

The employer who is liable for insurance benefits shall be the employer, in an undertaking of the kind in question, in which the person concerned was last employed before the appearance of the disease, unless it can be proved that the disease was due to employment in another undertaking.

ECUADOR

Act respecting liability for industrial accidents. Dated 6 October 1928. (*Ley sobre responsabilidad por accidentes del trabajo, 6 de octubre de 1928.*) (L. S., 1928, Ec. 5.)

For the purposes of the 1928 Act "accidents" shall be deemed to mean any bodily injury suffered by a wage-earner or salaried employee and arising out of or in the course of work which he performs on account of another; though occupational diseases might be included thereunder, the Act contains a further special definition in regard to these, designating as such diseases caused directly by engagement in the occupation of work performed by the wage-earning or salaried employee and causing

incapacity for work. It is further stated that the Ministry of Social Welfare and Labour shall issue special regulations to determine the occupational diseases covered by the above definition. The compensation to which the victim of an occupational disease is entitled is similar to that granted in the case of an industrial accident provided that the disease is declared to result exclusively from work engaged in at the moment at which the incapacity occurred. Compensation shall not be paid if it is proved that the wage-earning or salaried employee was suffering from the disease in question before engaging in the occupation which he has had to relinquish. Compensation is recoverable from the employer who employed the worker in the occupation which caused the disease. If the disease could be contracted gradually owing to its nature, the employers who employed the victim in the kind or kinds of work which caused the disease shall be bound to pay compensation in proportion to the period for which each of them employed the victim. This proportion shall be fixed by agreement or by a judge where a dispute arises concerning it.

FEDERATED MALAY STATES

An enactment to provide for the payment of compensation to workmen for injury by accident, No. 1 of 1929. Assented to 29 March 1929. (*F. M. St. Gov. Gaz.*, 1929, No. 9, p. 732.)

In default of proof to the contrary by the employer there are considered as industrial accidents for the purposes of the 1929 Act those occupational diseases inscribed in a schedule appended to the Act which is as follows:

Description of disease	Description of process
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Poisoning by phosphorus or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Poisoning by mercury or its sequelae.	Any process involving the use of mercury or its preparations or compounds.

Further, any worker who contracts anthrax infection is considered as suffering from occupational disease within the meaning of the Act when engaged in employment involving handling of wool, hair, bristles, animal carcasses, or in the

loading, unloading or transport of all such goods as well as in any work involving contact with infected animals.

This schedule is subject to modification as occasion arises in accordance with a decision by the Federal Council.

A worker suffering from occupational disease enjoys equal rights to the victim of an industrial accident provided he has been employed for a continuous period of at least six months in one of the processes mentioned in the second column of the schedule.

FINLAND

(a) Act of 17 July 1925 on workmen's compensation. (*Työväen tapaturmavakuutuslaki. 17 päivänä heinäkuuta 1925.*) (L. S., 1925, Fin. 3.)

(b) Order of 30 November 1925 relative to the application of the Act of 17 July 1925 as amended by the Order of 13 March 1926. (*Asetur Työväen tapaturmavakuutuslain toimeenpanemisesta 30 päivänä marraskuuta 1925.*) (Suomen Asetuskokoelma, 1925, No. 332, p. 1165.)

(c) Resolution of the Council of State of 17 December 1925 relative to the application to public works of the Act of 17 December 1925. (*Valtioneuvoston päätös, jolla määrätään missä malalaiskunnissa 17 päivänä heinäkuuta 1925 annettua tapaturmavakuutuslakia si tarvitse soveltaa erinäisten tijoälojen tijoütekiijöihin, 17 päivänä joulukuuta 1925.*) (Suomen Asetuskokoelma, 1925, No. 341, p. 1210.)

(d) Resolution of the Council of State respecting occupational diseases which are to be deemed to be equivalent to bodily injuries due to an accident. Dated 2 July 1926. (*Valtioneuvoston päätös siitä, mikä ammattistanti on Katsottava tapaturman aiheuttamaksi ruumiinvammaksi. 2 päivänä heinäkuuta 1926.*) (L. S., 1926, Fin. 3.)

The Act of 17 July 1925 assimilates to bodily injuries consequent upon accident any occupational disease contracted by a worker in manufacturing or manipulating certain substances specified in a list issued by the Council of State on the recommendation of the insurance council. This list is contained in the Resolution of the Council of State of 2 July 1926 and comprises the following substances:

Ammonia, amyl alcohol, aniline dyes, antimony compounds, arsenic compounds, benzine, benzol and its derivatives, phenol, lead and lead compounds, chlorine, unslaked lime, chloride of lime, mercury, its compounds and amalgams, hydrofluoric acid, formaldehyde, phosphorus, phosphoretted hydrogen, phosphine, carbon monoxide, carbon dioxide, methyl alcohol, caustic soda, caustic potash, nitroglycerine, petroleum, picric acid, pyridine, sulphuric acid, sulphurous acid, carbon disulphide, sulphuretted hydrogen, hydrochloric acid, coal-tar and vegetable tar, low acid compounds of nitrogen and derivatives

of nitrogen in gaseous form, nitric acid and nitrous acid, turpentine, cyanogen compounds; and also diseases caused by specially powerful radiant energy, and anthrax.

FRANCE

(a) Act of 9 April 1898 concerning responsibility for industrial accidents and later amendments. (*Journal Officiel* of 10 April 1898.)

(*Loi du 9 avril 1898 concernant les responsabilités des accidents dont les ouvriers sont victimes dans leur travail (J.O. du 10 avril 1898) et ses modifications ultérieures.*)

(b) Act to extend to industrial diseases the Act of 9 April 1898, respecting industrial accidents. Dated 25 October 1919. (*L. S.*, 1920, Fr. 7.)

(*Loi du 25 octobre 1919 étendant aux maladies d'origine professionnelle la loi du 9 avril 1898 sur les accidents du travail.*)

(c) Decree respecting the central commission on industrial decisions. Dated 19 November 1919. (*L. S.*, 1920, Fr. 6.)

(*Décret du 19 novembre relatif à la commission supérieure des maladies professionnelles.*) (*Bull. du Min. du Trav.* 1919, p. 199.)

(d) Decree of 31 December 1920 to issue public administrative regulations under the Act of 25 October 1919. (*Journal Officiel*, 7 January 1931.)

(*Décret du 31 décembre 1930 portant règlement d'application publique de la loi du 25 octobre 1919.*) (*J.O.* du 7 janvier 1921.)

(e) Act to extend the time limit fixed in the second paragraph of section 7 of the Act of 25 October 1919, to extend to industrial diseases the Act of 9 April 1898, respecting industrial accidents. Dated 15 July 1926. (*L. S.*, 1928, F. 7.)

(*Loi du 15 juillet 1926 prorogeant le délai prévu à l'article 7, paragraphe 2, de la loi du 25 octobre 1919 étendant aux maladies d'origine professionnelle la loi du 9 avril 1898 sur les accidents du travail.*) (*J.O.*, 1926, no. 166, p. 7906.)

(f) Decree respecting the compulsory notification of occupational diseases. Dated 16 November 1929. (*L. S.*, 1929, Fr. 9.)

(*Décret du 16 novembre 1929 relatif à la déclaration obligatoire des maladies d'origine professionnelle.*)

(g) Act of 1 January 1931 amending and supplementing the Act of 25 October 1919. (*L. S.*, 1931, Fr. 1.)

(*Loi du 1^{er} janvier 1931 modifiant et complétant la loi du 25 octobre 1919.*) (*J. O.*, du 4 janvier 1931.)

Since 1848, and during a certain time in the course of which the Government officially recognised that assistance and treatment for accident and disease constituted a real responsibility on the part of industrial establishments, and also as a result of the Order of the Ministry of Public Works dated 15 December 1848, amended by the Ministerial Circular of 22 October 1851, firms undertaking public works were obliged to make deductions from wages in order to provide benefits for workers, victims of accident or disease (occupational disease incurred in course of

such employment was assimilated to accidents). It was not, however, until 1880 that a Bill was introduced by Martin Nadaud on 29 May proposing compensation for accidents — no discrimination, however, being made between these and occupational diseases. It should, however, be added that in all later proposals of this kind, together with the reports to which they gave rise, accidents alone are referred to and no mention whatsoever is made of occupational diseases. Even in the first Government Bill (24 March 1885) recognising the principle of occupational risk and notwithstanding the fact that Article 2 admits the presence of this risk also in industries in which “by reason of the materials *handled* or *manufactured* the worker is exposed to accident”, it was not in fact the intention of the author of the Bill to include occupational diseases. The first attempt at providing compensation for these diseases is not encountered until 4 June 1888 when Camille Raspail introduced without success an amendment to the Report of the Commission of 28 November 1897 (of M. Duché) demanding the insertion of the following words: “during any work in course of which establishments, factories or workshops use toxic substances likely to cause serious and often incurable diseases . . .”

P. Richard in 1891 included accidents and diseases in general, with workers' contributions towards insurance; Fairé in 1893 during a discussion on responsibility for accidents brought in an amendment dealing with compensation for incapacity and death from so-called occupational disease and during the debate on the new text (October 1897) J. Goujon proposed the insertion of the words “or toxic” between the words “explosive” and “substances”. It is a well known fact that the Act passed on 9 April 1898 was intended to deal merely with accidents, the question of occupational diseases being left out of account.

Prior to the passing of this Act (9 April 1898) based on recognition of occupational risk, the victim of an industrial accident had merely recourse to the common law (Article 1382 of the Civil Code) in justifying his rights to compensation. The new system which introduced the principle of employers' responsibility in the matter should logically have applied also to injury caused to health as the result of the manipulation of harmful substances, but the issue was evaded by the legislative authorities at this time, because the measure in question was one

the consequences of which were uncertain and which was somewhat in the nature of an experiment.

The Act of 1898 provided benefit for "any bodily injury due to an external, sudden, or violent cause" and under these conditions legal rulings in many instances resulted in the refusal of benefits where the worker was suffering from an industrial disease. This judicial view was based on an Order of the Court of Cassation (3 November 1903) according to which the Act of 1898 did not apply to occupational diseases to which "it would not be possible to assign a given origin or date and which are none other than the consequence of habitual employment in a given industry."

Nevertheless, judicial findings showed an increasingly marked tendency to assimilate to accidents cases of acute disease (due to mephitic emanations and fumes; pneumonia, heatstroke, etc.). Further, Marestaing at the Surgical Congress at Paris (1889) asserted that "there can be no question of an accident except in the case of an injury, that is to say a traumatism due to a violent, accidental, and external cause, all deaths or working incapacity caused by the action of fire, jets of steam or collision with a compact body being thus considered as accidents as well as sudden asphyxia and poisoning due to injurious gases or water."

The movement in favour of the inclusion of diseases, increasingly sustained by amendments brought in in the course of debates on proposed amendments of the Act on accident compensation (Vaillant 1901), or by Bills dealing with occupational diseases, particularly those of Breton (1901, 1903, 1906) or drafted by the Government (Millerand) and the Commission on Social Insurance, finally culminated in 1919 in the Act which extended to this class of diseases provisions relative to accidents, an Act which at the present time regulates compensation for occupational diseases in France.

The definition of occupational diseases provided by the Act of 25 October 1919, assimilates to industrial accidents such diseases, defining them further as follows. The acute or chronic diseases mentioned in the schedule appended to the Act shall be deemed to be industrial diseases when they attack workers normally engaged in the industrial processes set opposite thereto. The schedule in its present form, as amended by the Act of 1 January 1931, is as follows:

1. Occupational lead poisoning :

(Diseases caused by lead and its compounds)

Period of liability: one year

Diseases due to lead poisoning	Industrial processes liable to cause lead poisoning among workers
	Metallurgical treatment and refining of lead.
	Casting and rolling of lead and its alloys.
	Casting of zinc with a lead content.
	Treatment of ores containing lead, including residues containing lead from zinc works.
	Tempering and annealing with lead.
	Typefoundry with alloys of lead.
	Manufacture and polishing of so-called tinware from alloys of lead.
	Soldering with alloys of lead.
Lead colic.	
Rheumatism due to lead poisoning.	
Paralysis of the extensor muscles and other forms of paralysis due to lead poisoning.	Soldering metal articles made of lead or with a lead content.
	Working composing machines in which an alloy of lead is used.
Nephritis.	Tinning with alloys of lead.
Cardio-vascular disorders due to lead poisoning.	Manufacture of toys from alloys of lead.
	Manufacture of metallic capsules and covers containing lead.
Lead gout.	
Lead anaemia.	Melting of old tins and other objects soldered with alloys of lead.
Meningo-encephalitis due to lead poisoning.	Handling type made of alloys of lead.
Amaurosis due to lead poisoning.	Handling or use of printing inks containing lead.
	Manufacture of lead compounds.
	Preparation and handling of compounds containing lead in crystal glass works.
	Manufacture and grinding of colours with a lead basis.
	Painting work of all kinds involving the use of substances containing lead or done on substances containing lead.

Diseases due to lead poisoning

Lead colic.
Rheumatism due to lead poisoning.
Paralysis of the extensor muscles and other forms of paralysis due to lead poisoning.
Nephritis.
Cardio-vascular disorders due to lead poisoning.
Lead gout.
Lead anaemia.
Meningo-encephalitis due to lead poisoning.
Amaurosis due to lead poisoning.

Industrial processes liable to cause lead poisoning among workers

Work with the blowpipe on substances coated with paint containing lead.
Manufacture and repair of lead accumulators.
Manufacture of drying oils and varnishes containing lead.
Manufacture of lead enamels and the application thereof.
Manufacture of pottery and glazed earthenware with enamels containing lead.
Decoration of china with enamels containing lead.
Enamelling of metals with enamel containing lead.
Varnishing and lacquering with products containing lead.
Dyeing with colours or substances containing lead.
Manufacture of artificial flowers involving the use of lead colours.
Polishing by means of lead filings or putty powder with a lead content.

2. Occupational hydrargyrisms

(Diseases caused by mercury and its compounds)

Period of liability: one year

Diseases due to mercury poisoning

Mercurial stomatitis.
Mercurial tremors.
Mercurial paralysis.
Mercurial anaemia.
Mercurial nephritis.

Industrial processes liable to cause mercury poisoning among workers

1. Distillation of mercury.
2. Manufacture of incandescent lamps and radiographic tubes with the use of the mercury blowpipe.
3. Manufacture of mercurial barometers, manometers and thermometers.
4. Gilding, silvering and tinning with the use of mercury.
5. Manufacture of mercury compounds (azotate, chlorides, cyanide, etc.).
6. Carrotting of furs with acid nitrate of mercury and felting of the carrotted furs.
7. Treatment of furs and skins with mercury compounds.
8. Bronzing and damascening with mercury compounds.
9. Stuffing animals with the use of mercury compounds.
10. Manufacture of fulminate of mercury primers.
11. Manufacture and repair of mercury accumulators.

3. Occupational poisoning by means of tetrachlorethane

(Diseases caused by tetrachlorethane)

Period of liability: one year

Diseases due to tetrachlorethane poisoning	Industrial processes liable to cause tetrachlorethane poisoning among workers
Jaundice, cirrhosis, polyneuritis caused by tetrachlorethane.	<div><div>1. Manufacture of artificial pearls.</div><div>2. Various processes using tetrachlorethane as a solvent.</div></div>

4. Occupational benzene poisoning

(Diseases caused by crude or rectified benzene)

(C^6H^6 and its homologues)

Period of liability: one year

Diseases due to benzene poisoning	Industrial processes liable to cause benzene poisoning among workers
Gastro-intestinal disorders due to benzene accompanied by recurrent vomiting.	Production of benzol by the distillation of coal and tar, and its use.
Polyneuritis of the lower limbs due to benzene.	Rectification of benzene (C^6H^6).
Ocular troubles due to benzene (optic neuritis).	Extraction of fatty substances, extraction of fat from bones and from skins of geese, manufacture of colouring matters, dyeing and cleaning, feather-dressing, manufacture and repair of pneumatic tyres, manufacture of water-proof cloth, clothing, boots and shoes and hats involving the use of benzene.
Haemorrhagic purpura.	In all the above processes, operations effected within carefully closed apparatus such that no odour of benzene is perceptible are excluded.
Progressive anaemia accompanied by leucopenia and mononucleosis.	
Acute attacks due to benzene poisoning (coma, convulsions).	

5. Occupational phosphorism

(Diseases caused by white phosphorus)

Period of liability: one year

Diseases due to phosphorus poisoning	Industrial processes liable to cause phosphorus poisoning
Phosphorus necrosis.	<div><div>Manufacture of strips of phosphorus paste for relighting miners' lamps.</div><div>Manufacture of detonating toys involving the use of white phosphorus.</div></div>

6. Poisoning caused by the action of X-rays or the following radio-active substances : uranium and its salts, uranium-X, ionium, radium and its salts, radon, polonium, thorium, mesothorium, thorium-X, thoron, actinium

Diseases due to X-rays or other radio-active substances

1. Acute and chronic radio-dermatitis and radium dermatitis.
Period of liability: one year.
2. Radiologist's cancer.
Period of liability: five years.
3. Simple anaemia accompanied by leucopenia caused by rays.
Period of liability: one year.
4. Pernicious anaemia caused by rays.
Period of liability: one year.
5. Leukaemia caused by rays.
Period of liability: one year.
6. Radio-necrosis of the bones caused by rays.
Period of liability: one year.

Processes liable to cause these diseases

- Extraction of radio-active substances from ores.
- Manufacture of derived radio-active substances.
- Manufacture of medical apparatus for radium treatment and X-ray apparatus.
- Research or manipulative operations on radio-active substances and X-rays in laboratories.
- Manufacture of radio-active chemical and pharmaceutical products.
- Manufacture and application of luminous products with radium content.
- Work in clinics, medical, dental and radiological laboratories, anti-cancer hospitals and centres in which workers are exposed to rays.
- Sale and hire of radium and radio-active substances.
- Work in all industries and businesses using X-rays and radio-active substances.

The Act of 25 October 1919 stipulates that, with a view to the prevention of occupational diseases and the eventual extension of the provisions comprising it, notification of all diseases of occupational character shall be compulsory. These diseases are to be found in a list established by Decree after consultation with the Central Commission on Occupational Diseases, and any medical practitioner or health official who has knowledge of such diseases is obliged to notify the same. The Decree of 16 November 1929 (the third of this kind issued subsequent to the withdrawal of the Decree of 4 May 1921 and that of 19 February 1927), enumerates these diseases as follows:

1. All diseases of an occupational character caused by:
 - (a) lead and its compounds;
 - (b) mercury and its compounds;
 - (c) hydrocarbons and their chlorine and nitro derivatives, in particular benzene, tetrachlorethane, carbon tetrachloride, perchlorethylene, trichlorethylene, dichlorethylene, chloroform, pentachlorethane, nitrobenzenes;

- (d) aniline and its derivatives;
- (e) carbon disulphide;
- (f) nitrous fumes, chlorine and other chloric gases, bromine, hydrofluoric acid, sulphurous anhydride, sulphuretted hydrogen, hydrosulphide of ammonia, hydrocyanic acid, picric acid, carbon monoxide, carbonyl chloride (phosgene), formaldehydes;
- (g) white phosphorus and phosphuretted hydrogen;
- (h) arseniuretted hydrogen and other arsenic compounds;
- (i) the action of pitch, tar, mineral oils, bitumen, cement, lime and other corrosive substances;
- (j) the action of chromic acid and alkaline chromates;
- (k) the action of X-rays and radio-active substances.

2. Cases of:

- (a) cancer of occupational origin, other than cases notified on account of one of the above-mentioned causes;
- (b) ankylostomiasis¹;
- (c) pulmonary diseases caused by the inhalation of siliceous, calcareous or argillaceous dust;
- (d) pulmonary diseases caused by the inhalation of coal dust;
- (e) diseases of the eyes caused by industrial sources of intense heat or light.

Apart from this notification rendered compulsory in view of prevention, all occupational diseases for which compensation is claimed in virtue of the Act of 1919 must be declared within fifteen days of cessation of work. The disease must be notified to the mayor of the commune who shall prepare a record of the notification and shall at once give a receipt for it. A medical certificate stating the nature of the disease and its probable consequences shall be required as a supplement to this notification, the form of which shall be prescribed by Decree. A certified copy of the notification shall be transmitted at once by the mayor to the head of the undertaking in which the worker was employed and to the departmental labour inspector or to the mining engineer responsible for the supervision of the undertaking. The period for taking legal action shall begin on the date of the notification. The operations of the National Accident Insurance Fund established by the Act of 1868 shall be extended to include the risks mentioned in the Act of 1919, connected with industrial diseases which have caused death or permanent incapacity, whether complete or partial. The premiums shall be fixed at such sums as will completely cover the risks and general expenses of management of the Fund.

¹ In virtue of Article 139 of the Finance Act of 13 July 1911 the expenses (medical, pharmaceutical, hospital) necessary for the treatment of miners suffering from ankylostomiasis are to be defrayed by mine owners. Further, during the period of treatment the miners receive a daily indemnity in accordance with the Act of 9 April 1898.

When a worker leaves an undertaking to which the Act in question applies, his employer shall continue to be responsible for any industrial disease to which the undertaking is liable to give rise which may attack the said worker during the period, specially stated in the schedule referred to for each of the said diseases. His responsibility, however, shall be diminished in proportion to the time which has elapsed between the worker's leaving the undertaking and the date when he is incapacitated for work and consequently entitled to compensation. If at the latter date the worker is employed in another undertaking which is also scheduled amongst the undertakings liable to give rise to the said disease, his new employer shall be responsible only for the surplus of the compensation fixed under the Act of 1898 (Articles 3 and 4) in the case of industrial accidents. The latest responsible employer shall be liable to the worker or his heirs for the whole amount of the compensation, but may take proceedings for recovery from previous employers. Any industrial employer who, as a result of improved technique in his establishment, ceases or becomes exempt from obligations under the Act, nevertheless shall be responsible during the period of liability fixed for his undertaking and dating from the moment of his agreement.

A Central Commission on Occupational Diseases established by the Act of 1919 has the special duty of giving its opinion on proposed amendments to the schedules enumerating the occupational diseases covered, and on proposed extensions to the Act concerning occupational diseases, and on all medical and technical questions referred to it by the Ministry of Labour.

GERMANY

(a) Federal Insurance Code (*Reichsversicherungsordnung*) of 1924 and text of the third Act of 20 December 1928 of the said code. (L. S., 1924, Ger. 10, and L. S., 1928, Ger. 3.)

(b) Order (Second) of 11 February 1929 dealing with the extension of accident insurance, diseases of occupational origin. (*Zweite Verordnung über Ausdehnung der Unfallversicherung auf Berufskrankheiten vom 11. Febr. 1929.*) (L. S., 1929, Ger. 1.)

Social legislation (1st Act, of 5 June 1883 for diseases, and of 6 July 1884 for accidents), did not cover occupational diseases. It should, however, be stated that no discrimination was made between ordinary diseases and occupational diseases. It was

therefore necessary to obtain a legal ruling in each instance as to whether an industrial accident or an occupational disease was involved. A worker claiming compensation for injury incurred had to make appeal under the common law (Article 618 C.6) establishing proof of occupational origin and of fault on the part of the employer.

It is true that a provision of the Sickness Insurance Act made it compulsory for employers to organise a factory fund whenever their employees amounted to fifty or upwards and that this provision was applicable for any number of employees whenever the industry in question was one involving a special health risk. Such sickness insurance, however, did not imply compensation for the injury.

Nevertheless Article 547 of the Sickness Insurance Act permitted the Federal Council to extend the compensation provided for accidents to occupational diseases. Meanwhile authorities in Germany continued to insist that, despite the difficulties which the extension of accident insurance to cover occupational diseases might encounter, the establishment of a schedule of diseases would obviate the necessity for special legal rulings in each case. Such a schedule, it was stated, would not necessitate much preliminary research, since the work of experts, daily experience of sickness insurance funds, and the results of compulsory notification would in themselves furnish the requisite data.

As regards compulsory *notification*, it had come into force in Saxony in 1907 for cases of phosphorus poisoning, arsenic poisoning and anthrax; in 1909 in the Reich for anthrax; in 1912 in Prussia, for lead, mercury, anthrax, and phosphorus poisoning; in 1911 in Bavaria for poisoning by lead, mercury, arsenic, phosphorus, benzol, the nitro and amido derivatives, nitrous fumes, for compressed air disease, anthrax, ankylostomiasis, glanders; in 1912 in Baden, etc.

By virtue of Articles 547, 922 and 1057 (a) of the Insurance Code (amended by the Act of 20 December 1928), a first Order, dated 12 May 1925 was issued, enumerating in a schedule those diseases to be assimilated to accidents, and containing all the special provisions relative to these. This Order was replaced by a second, dated 11 February 1929, which came into force retroactively as from 1 January, and which still regulates compensation for occupational diseases.

According to Section 1 of the Order of 11 February 1929 for the purposes of accident insurance, "occupational diseases" shall mean the diseases specified in the second column of the schedule, provided that they are caused by industrial employment in one of the establishments mentioned in the third column of the schedule opposite the disease in question. The schedule is as follows:¹

Occupational disease	Establishments and activities
1. Diseases caused by lead or its compounds.	Items 1-14 in the first column: Establishments and activities liable to accident insurance.
2. Diseases caused by phosphorus.	
3. Diseases caused by mercury or its compounds.	
4. Diseases caused by arsenic or its compounds.	
5. Diseases caused by manganese compounds.	
6. Diseases caused by benzol or its homologues.	
Diseases caused by nitro and amido compounds of the aromatic group.	
7. Diseases caused by carbon disulphide.	
8. Diseases caused by sulphuretted hydrogen.	
9. Diseases caused by carbon monoxide.	
10. Diseases caused by X-rays and other forms of radiant energy.	
11. Chronic and chronically recurrent skin diseases caused by galvanising operations.	
12. Chronic and chronically recurrent skin diseases caused by various kinds of foreign wood.	
13. Chronic and chronically recurrent skin diseases caused by soot, paraffin, tar, anthracene, pitch and similar substances.	
14. Diseases of the muscles, bones and joints caused by work with compressed air apparatus.	Basic slag mills, machines for mixing fertilisers and establishments transporting powdered basic slag.
15. Diseases of respiratory system and lungs caused by powdered basic slag.	

¹ Anthrax is not included in the schedule but is compensated as an accident.

Occupational disease	Establishments and activities
16. Serious pneumoconiosis (silicosis). If serious pneumoconiosis occurs simultaneously with pulmonary tuberculosis, the tuberculosis shall for the purposes of compensation be deemed to be pneumoconiosis.	(a) Undertakings for quarrying rough working and finishing sandstone; (b) undertakings for metal grinding; (c) chinaware undertakings; (d) mining undertakings.
17. Schneeberg miner's lung disease.	Metalliferous mines in the Schneeberg district (Republic of Saxony)
18. Deafness or hardness of hearing approximating to deafness caused by noise.	Establishments for metal working and finishing.
19. Cataract.	Glass and iron works, foundries.
20. Ankylostomiasis.	Mining undertakings.
21. Tropical diseases, spotted fever, scurvy.	Seafaring undertakings.
22. Infectious diseases.	Hospitals, infirmaries and nursing homes, maternity homes and other institutions which receive patients for treatment and nursing; also establishments and activities belonging to public and free welfare services and the public health service, and laboratories for scientific and medical research and experiments.

The provisions of the Order with respect to establishments shall apply *mutatis mutandis* to activities covered by the accident insurance system.

Section 7 of the Order makes it compulsory for a medical practitioner who diagnoses in an insured person any occupational disease or symptoms justifying the presumption that an occupational disease is present to notify at once such disease to the local insurance office. This office, after consultation with the competent medical association, may impose a disciplinary fine on a medical practitioner who fails to give this notice or does not give it in due time.

The local insurance office shall transmit a copy of the notice to the insurance carrier within twenty-four hours and shall at the same time institute an enquiry. The Office shall cause every sick person to be examined by a suitable medical practitioner at the expense of the insurance carrier. It shall decide to what extent further enquiry shall be made; it may itself conduct the enquiry or may request the local police authority to do so ¹.

¹ In the case of seamen's accident insurance the Federal Insurance Office may issue regulations for procedure with respect to accident notices and accident enquiries which differ from the provisions of the Federal Insurance Code.

The local insurance office shall transmit a second copy or an extract therefrom to the official medical practitioner and the industrial inspection official in conformity with more detailed regulations laid down by the supreme administrative authority.

Section 3 provides that in the application to occupational diseases of the provisions relating to accident insurance¹, illness due to an occupational disease shall be deemed to be equivalent to bodily injury due to an accident, and death in consequence of an occupational disease shall be deemed to be equivalent to death in consequence of an accident. The victim

¹ Compensation for occupational accidents is regulated by the Federal Insurance Code. This comprises workers and employees in industrial and agricultural establishments, and engaged in maritime transport. The principal insurance carriers are compulsorily formed groups of proprietors of insured establishments under the supervision of the competent authority. Further, the Federal Government, the districts, communes and communal unions, as well as the State railway companies, constitute institutions upon which devolve insurance for certain undertakings belonging to them. The insured have a right to collaborate in the administration of measures relative to accident insurance and the prevention of accidents. Insurance benefits in case of bodily injury include: medical treatment, vocational aid and the allocation of an allowance to the victim; in the case of death there is a lump sum or indemnity, and an allowance payable to the dependants. In principle for all accidents which do not involve incapacity in excess of eight weeks certain benefits (medical treatment, benefits in kind) are granted by the sickness fund.

The amount of the allowance accorded to the victim is dependent on the diminution of earning capacity consequent on the accident, on the amount of the victim's annual earnings, and on the situation of his family. In the case of total incapacity, the victim receives the entire allowance. This amounts to two-thirds of the annual earnings. In the case of partial incapacity, the victim receives part of the whole allowance corresponding to the reduction in earning capacity. For the calculation of the allowance annual earnings correspond to the wages paid to the victim in the course of the year preceding the accident. The victim who receives an allowance of 50 per cent. or over of the entire allowance is entitled further to an allowance of 10 per cent. of that amount for each child under fifteen years of age. Under certain conditions (occupational training, physical infirmity), the child's allowance may be granted beyond the fifteenth year. The widow receives an allowance equal to a fifth of the annual earnings of the deceased, and for as long as she may have, on account of disease or other infirmity, lost at least a half of her working capacity, she is entitled to an allowance equal to two-thirds of the total earnings. The allowance for orphans, which is paid for the same length of time as the allowance for children, is one-fifth of the annual earnings. Under certain conditions the allowance may be paid to the widow or widower as well as to parents or grandparents. The allowance may be replaced by a single capital sum. The total allowances to all dependants of a deceased worker may not exceed four-fifths of his annual earnings. Certain amendments to the above provisions have been made in the Emergency Orders issued 8 December 1931 and 14 June 1932.

and his dependants are similarly placed as if coming within the Federal Insurance Code ¹.

The Order provides further (paragraph 5) that if there is reason to fear that an occupational disease will occur, recur or be aggravated if the insured person continues to be employed in an establishment which is liable to insurance against the disease, the insurance carrier may grant him a transition allowance amounting to not more than half a full pension so long as he refrains from employment in such establishment.

The pension on account of incapacity for work shall be granted in addition to the transition allowance.

The Order of 11 February 1929 which came into force on 1 January 1929 annuls from that date the Order of 12 May 1925 which extended accident insurance to cover diseases of occupational origin contracted in industry; it provides that disease of occupational origin which was present on the date on which this Order came into operation or which occurred subsequently entitles the victim to compensation when the principal cause of the disease is gainful employment engaged in subsequent to 31 December 1919 in one of the establishments specified in the appendix.

In this case the claim for compensation shall be lodged not more than one year after the coming into operation of this Order, under penalty of disallowance, with the insurance carrier covering the establishment to which the harmful effects are attributed. The time limit shall also be deemed to be observed if the claim is lodged in due time with another accident insurance carrier, a local insurance office or the Federal Insurance Office. Section 1547 of the Federal Insurance Code shall apply, *mutatis mutandis*, provided that the time limit shall be one year in case of subsequent notification. Compensation shall not be granted from any date before the coming into operation of this Order.

The insurance carrier shall hold a formal enquiry to decide respecting claims in conformity with the above provisions. In the eventuality of the insurance carrier disallowing the claim, appeal may be lodged with the Occupational Diseases Commission of the Federal Insurance Office within one month of the com-

¹ Paragraph 4 of the Order of 11 February 1929 adds that in the case of seamen's occupational diseases compensation shall be granted even if the insured person contracted disease while ashore on leave for his private affairs. This shall not apply if the insured person contracted the disease through his own fault.

munication of the decision. Appeals should be lodged in the same manner as those relative to occupational accidents.

As has been mentioned above, the Federal Insurance Office is assisted by an Occupational Diseases Commission consisting of a chairman and two representatives each of employers and employees, a medical practitioner, and a permanent member of the Insurance Office. The two latter are appointed by the Federal Minister of Labour, the medical practitioner for each individual case by the president of the Insurance Office, and the employers' and employees' representatives being chosen from lists of candidates drawn up by the Provisional Federal Economic Council. The employers' and workers' representatives shall belong as far as possible to the occupation in which the occupational disease in question occurs.

GREAT BRITAIN

(a) An Act to consolidate with amendments the factory and workshops Acts, 17 August 1901. (*Public General Acts*, 64 Vict. 1900 — 1 Edw. VII, 1901, p. 64.)

(b) Notification of diseases. (Toxic jaundice.) Order No. 1170, 27 November 1915. (*Factory and Workshop Orders*, 1929 editn., p. 43.)

(c) Notification of diseases. (Epitheliomatosis and chrome ulceration.) Order No. 1775, 28 November 1919. (*Factory and Workshop Orders*, 1929 editn., p. 43.)

(d) Notification of diseases. (Carbon bisulphide, aniline and chronic benzene poisoning.) Order No. 1505, 31 December 1924. (*Factory and Workshop Orders*, 1929 editn., p. 44.)

(e) An Act to consolidate the law relating to compensation to workmen for injuries suffered in the course of their employment. Dated 22 December 1925. (*L. S.*, 1925, G.B. 3.)

(f) The Workmen's Compensation (Industrial Diseases) Order, 1927, dated 30 April 1927, made by the Secretary of State under section 43 (3) of the Workmen's Compensation Act, 1925. S.R. & O. 1927, No. 386. (*L. S.*, 1927, G.B. 2B.)

(g) The Workmen's Compensation (Industrial Diseases) Consolidation Order, 1929, dated 1 January 1929, made by the Secretary of State under section 43 of the Workmen's Compensation Act, 1925, consolidating the Orders of 26 February 1918, 31 December 1921, 2 January 1923, 16 January 1924, 18 May 1925, and 30 April 1927, with amendment. S.R. & O. 1929, No. 2. (*L. S.*, 1929, G.B. 1.)

(h) The Workmen's Compensation (Industrial Diseases) Order, 1932, dated 30 April 1932, made by the Secretary of State, extending the provisions of section 43 of the Workmen's Compensation Act, 1925. S.R. & O. 1932, No. 314. (*L. S.*, 1932, G.B. 3.)

(i) The Workmen's Compensation (Cataract) Order, 1932, dated 3 June 1932, made by the Secretary of State, amending the Workmen's Compensation (Industrial Diseases) Consolidation Order, 1929, made under section 43 of the Workmen's Compensation Act, 1925. S.R. & O. 1932, No. 424. (*L. S.*, 1932, G.B. 3.)

In the course of the incessant development of measures applied in Great Britain for the protection of workers, the inception of which dates back to 1802, attention was immediately drawn to the industrial and social gravity of occupational disease.

The Factory Act of 1895 (Article 29) provided for compulsory notification on the part of all medical practitioners attending cases to the Chief Inspector of Factories, of cases of poisoning by lead, phosphorus, arsenic, mercury and of anthrax, and this obligation formed part of the new Act of 1901 (Article 73, actually in force and later completed by successive Orders in 1915, 1919, 1924, etc.).

The employer was likewise placed under a similar obligation by being obliged to notify cases of occupational disease to the factory inspectorate and certifying surgeon.

Further, the organisation a century ago (1833) of factory inspection, to direct which Dr. A. Whitelegge was appointed in 1895, was completed in 1898 by the creation of a medical service under the direction of Dr. Legge. The very thorough studies and the numerous enquiries organised or stimulated by Dr. Legge in regard to unhealthy trades, the research effected by certifying surgeons, medical practitioners and scientific experts rapidly facilitated the collection of sufficient data in Great Britain to enable the carrying into effect of measures for compensation of occupational diseases. Meanwhile there came into force (June 1898) the Act of 1897 dealing with benefits accorded to victims of industrial accidents in certain industries only. This Act did not cover occupational diseases, yet many experts, in view of the effects of injuries sustained, were unwilling to distinguish between the results of an accident in the factory and those connected with work engaged in in a trade recognised as unhealthy. These experts were therefore desirous of extending to occupational diseases the protection offered by the Act of 1897. As this Act, however, only dealt with accidents it became a source of constant litigation when, for instance, attempts were made to include a fatal case of anthrax. It was for this reason that the proposal to include in the Bill compensation for occupational diseases had been rejected. It is nevertheless the case that the measure had already been voluntarily applied by certain far-seeing employers and that in 1901 suggestions to this effect were made at the Pottery Arbitration at Stoke-on-Trent, a scheme being formulated by a committee of employers,

representatives of the operatives and the Ocean Industrial Insurance Company, under which all workers in dangerous processes in the pottery industry should be enabled to insure against lead poisoning, the premium to be supplemented by contributions from the manufacturers.

It is true that the power accorded to the Secretary of State to issue regulations under the Factory Act of 1901 was largely instrumental in stimulating improvement in conditions of health and sanitation in factories. The moment was ripe for further action and in 1904 a Commission was appointed to study practical procedure calculated to facilitate extension of the Acts of 1897—1900, at the moment under revision in the House of Commons, to include occupational lead poisoning. An enquiry effected attempted, at least as far as the pottery industry was concerned, to establish the ratio between cases of lead poisoning and the number of workers engaged in the various operations involving exposure to the lead risk. It was, however, found impossible to obtain similar data with regard to other industries involving exposure to lead poisoning. Nevertheless, the Workmen's Compensation Act of 21 December 1906, a draft of which was signed by Mr. Gladstone, and which came into force on 1 July 1907, extended the provisions of the Acts of 1897—1900 and provided in particular for the granting of compensation for six industrial diseases: poisoning by lead, phosphorus, arsenic and mercury, anthrax and ankylostomiasis, which were for the purposes of the Act assimilated to accidents. This Act, to which none of the former objections were raised, was almost immediately extended by the Order of 22 May 1907 to cover eighteen other diseases adopted by the House of Commons from a list of forty-two affections enumerated in the official report of the Departmental Commission appointed in August 1906 to study and recommend injuries and diseases of definitely occupational origin with a view to their addition in the schedule of 1906. Further, a wider interpretation was given to cases of poisoning by lead and arsenic.

A second extension: that of 2 December 1908, was the outcome of the Departmental Report of 12 October. Subsequent amendments were followed by the Act of 16 November 1923 for which was substituted later the Act of 22 December 1925 which, together with Orders issued subsequently, at the present moment regulates compensation for occupational diseases.

These diseases are defined in the schedule appended to the Act of 1925 amended subsequently by the Order of 30 April 1927, 1 January 1929, 30 April 1932 and 3 June 1932.

This schedule is at present as follows:

Description of disease or injury	Description of process
Anthrax.	Handling of wool, hair, bristles, hides, and skins.
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or its compounds. Handling of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Handling of arsenic or its preparations or compounds.
Lead poisoning or its sequelae.	Handling of lead or its preparations or compounds.
Poisoning by benzene and its homologues, or the sequelae.	Handling benzene or any of its homologues, or any process in the manufacture or involving the use thereof.
Poisoning by nitro and amido derivatives of benzene and its homologues (trinitro-toluene, anilin and others), or the sequelae.	Handling any nitro or amido derivative of benzene or any of its homologues, or any process in the manufacture or involving the use thereof.
Poisoning by dinitrophenol or its sequelae.	Handling dinitrophenol, or any process in the manufacture or involving the use thereof.
Poisoning by nitrous fumes or its sequelae.	Any process in which nitrous fumes are evolved.
Dope poisoning (that is, poisoning by any substance used as or in conjunction with a solvent for acetate of cellulose) or its sequelae.	Any process in the manufacture of air-craft.
Poisoning by tetrachlorethane or its sequelae.	Any process in the manufacture or involving the use of tetrachlorethane.
Poisoning by carbon disulphide or its sequelae.	Any process involving the use of carbon disulphide or its preparations or compounds.
Poisoning by nickel carbonyl or its sequelae.	Any process in which nickel carbonyl gas is evolved.
Poisoning by <i>Gonioma Kamassi</i> (African boxwood) or its sequelae.	Any process in the manufacture of articles from <i>Gonioma Kamassi</i> (African boxwood).
Manganese poisoning.	Handling of manganese or substances containing manganese.

Description of disease or injury	Description of process
(a) Dermatitis produced by dust or liquids.	—
(b) Ulceration of the skin produced by dust or liquids.	—
(c) Ulceration of the mucous membrane of the nose or mouth produced by dust.	—
(a) Epitheliomatous cancer or ulceration of the skin due to tar, pitch, bitumen, mineral oil or paraffin, or any compound, product or residue of any of these substances.	Handling or use of tar, pitch, bitumen, mineral oil or paraffin, or any compound, product or residue of any of these substances.
(b) Ulceration of the corneal surface of the eye, due to tar, pitch, bitumen, mineral oil or paraffin, or any compound, product or residue of any of these substances.	Handling or use of tar, pitch, bitumen, mineral oil or paraffin, or any compound, product or residue of these substances.
Chrome ulceration or its sequelae.	Any process involving the use of chromic acid or bi-chromate of ammonium, potassium, or sodium, or their preparations.
Scrotal epithelioma (chimney-sweep's cancer).	Chimney-sweeping.
Compressed air illness or its sequelae.	Any process carried on in compressed air.
Cataract in glassworkers.	Any process in the manufacture of glass involving exposure to the glare of molten glass.
Cataract caused by exposure to rays from molten or red-hot metal.	Any process normally involving exposure to rays from molten or red hot metal in the manufacture of iron or steel, including re-heating and rolling iron or steel.
Ankylostomiasis.	Mining.
The disease known as miner's nystagmus, whether occurring in miners or others, and whether the symptom of oscillation of the eyeballs be present or not.	Mining.
Subcutaneous cellulitis of the hand (beat hand).	Mining.
Subcutaneous cellulitis or acute bursitis arising at or about the knee (beat knee).	Mining.
Subcutaneous cellulitis or acute bursitis over the elbow (beat elbow).	Mining.
Inflammation of the synovial lining of the wrist joint and tendon sheaths.	Mining.
Glanders.	Care of any equine animal suffering from glanders; handling the carcass of such animal.

Description of disease or injury	Description of process
Telegraphist's cramp.	Use of telegraphic instruments.
Writer's cramp.	—
Twister's cramp caused by twisting of cotton or woollen (including worsted) yarns.	—
Inflammation, ulceration or malignant disease of the skin and subcutaneous tissues due to exposure to X-rays or radio-active substances.	—
A localised new growth of the skin, papillomatous or keratotic, due to mineral oil.	Cotton spinning by means of self-acting mules.

Article 47 of the Act of 1925, stipulates that the disease "known as fibroid phthisis, silicosis of the lung", or, from "that disease accompanied by tuberculosis" may entitle workmen suffering therefrom to compensation in certain industries or processes. It must be proved by medical examination that the workman in question is suffering from silicosis or silicosis accompanied by tuberculosis to such an extent that he may not without danger continue his employment in the industry or process in which he was engaged and that suspension from employment is considered necessary.

The provisions of Article 47 are extended by the Act, dated 1 August 1930, to cover industries involving exposure to asbestos dust ¹.

Compulsory notification of occupational diseases ^{*} was required by Article 73 of the Factory Act of 1901, for all cases of poisoning by lead, phosphorus, arsenic, mercury and anthrax infection. Various later Orders issued in application of paragraph 4 of the said Article 73 have resulted in the addition of *toxic jaundice* due to poisoning by tetrachlorethane, by nitro and amido derivatives of benzene or other toxic substance (Order of 27 November 1915), epitheliomatous ulceration due to tar, pitch, bitumen, mineral oil or paraffin, any compound, product or residue of any of these substances, and *chrome ulceration* due to chromic acid, bi-chromate of potassium, sodium, or ammonium, or any other preparation of these substances (Order of 28 November 1929), and poisoning by *carbon disulphide*, *aniline poisoning*, and *chronic benzene poisoning* (Order of 31 December 1924).

¹ For compensation for silicosis and asbestosis see special section devoted to "Silicosis".

The aim of these measures was prophylactic. Notice of the disease entitling a workman to compensation must be given to the employer who last employed the workman during the past twelve months in employment, to the nature of which the disease was due or which has caused death or suspension from work, and the notice may be given notwithstanding the fact that the workman has voluntarily left his employment.

A victim of an occupational disease is entitled to compensation similar to that accorded in the case of an accident¹, when incapacity or death has been certified by the certifying surgeon as due to one of the diseases mentioned in the schedule, or where in accordance with the application of the special Orders issued under the Factory and Workshops Act (1901) he is suspended from work by reason of the fact that he has contracted one of these diseases. In the case of death, his dependants are equally entitled to compensation. The disease must be certified as due to the nature of the employment on which the workman has been engaged at any time within the twelve months previous to the date of his death, disablement or suspension from work, whether under one or more employers.

If it is proved that the workman has, at the time of entering the employment, wilfully and falsely represented himself in

¹ Article 1 of the Act of 22 December stipulates that if in any employment personal injury by accident arising out of and in the course of employment is caused to a workman, his employer shall be liable to pay compensation. According to Article 3 of the Act, "workman" means any person who has entered into or works under a contract of service or apprenticeship for the employer whether by way of manual labour, clerical work or otherwise, and whether the contract is expressed or implied orally or in writing. The following persons are excepted from the definition of workmen, namely, any person employed otherwise than by way of manual labour whose remuneration exceeds £350 a year, or a person whose employment is of a casual nature, and who is employed otherwise and for the purpose of the employer's trade or business, not being a person employed for the purposes of any gain or recreation, and engaged or paid through a club, or a member of the police force, or an out worker or a member of the employer's family, dwelling in his house. The amounts of compensation are stipulated under Articles 8 and 9 of 22 December 1925, which states that when the injury causes death, the compensation paid shall consist of a lump sum with a supplementary payment when the worker leaves a widow or other member of his family (excluding children under the age of fifteen who were exclusively or partially supported by his earnings, or when he leaves one or several children under fifteen years of age wholly dependent on him. The amount of this lump sum and the allowance for children shall not, however, exceed £600 sterling. Where the injury involves total or partial incapacity, the compensation shall be paid in the form of a weekly payment provided that if the incapacity lasts less than four weeks, no compensation shall be payable in respect of the first three days. The weekly payment shall in no case exceed 30s.

writing as not having previously suffered from the disease, compensation shall not be payable. Assessment of incapacity is entrusted to a certifying surgeon, and for the purposes of the Act, the date of disablement shall be such date as the certifying surgeon certifies as the date on which the disablement commenced or where he is unable to do so, the date on which the certificate is given. Should, however, the certifying surgeon refuse a certificate of disablement or should an employer or workman be aggrieved by the action of a certifying or other surgeon in refusing to give a certificate of disablement or suspending or refusing to suspend a workman, the matter shall be referred to a medical referee who may allow an appeal, in which case, the date of disablement shall be such date as the medical referee may determine. Where a workman dies without having obtained a certificate of disablement or is at the time of death in receipt of a weekly payment on account of disablement, it shall be the date of death.

Nothing in this section of the Act shall affect the rights of a workman to recover compensation in respect of a disease to which this section does not apply if the disease is a personal injury by accident within the meaning of the Act.

In regard to occupational diseases in the schedule, compensation remains similar to that granted in the case of accidents. The amount of compensation shall be calculated with reference to the earnings of the workman while under the employer from whom compensation is recoverable.

The Act stipulates that where a workman at the moment of, or immediately prior to, the date of such disablement or suspension from work was employed in any process mentioned in the second column of the schedule, and the disease contracted is the disease in the first column of that schedule set opposite the description of the process, the disease, except where the certifying surgeon certifies that in his opinion the disease was not due to the nature of the employment, shall be deemed to have been due to the nature of that employment unless the employer proves the contrary. On the other hand, compensation is not exclusively limited to workmen engaged in the processes mentioned in the second column opposite the disease in question, but may be claimed by any workman suffering from any of the diseases in the schedule, though in this latter case, the onus of proving the disease is due to the nature of the employment

rests with the workman, and similarly if a workman has not been employed in a scheduled process the onus of proof lies on him. Special restrictions relative to compensation exist in the case of certain diseases. Thus for example the Order of 1 January 1929 adds that in the case of a workman suffering from dermatitis produced by dust or liquids, ulceration of the skin produced by dust or liquids, or ulceration of the mucus membrane of the nose or mouth produced by dust, compensation may not be claimed on account of the said disease if he is thereby only disabled from the employment of the particular process in which the disease has been contracted or other processes involving risk of the said disease, unless the judge, committee or arbitrator is satisfied that the disease has been contracted from long and continued exposure to dust or liquids in the industry in which he was engaged at the time of his disablement. As regards a person suffering from writer's cramp, compensation is accorded on account of that disease for a period not exceeding twelve months. A person suffering from twister's cramp (cotton or woollen, including worsted yarns) shall not be entitled to compensation unless he is totally disabled from following the occupation in question and compensation shall cease as soon as he is able to earn at another occupation a weekly sum equal to 75 per cent. of the average weekly earnings on which the compensation has been fixed, or at the expiration of six months, whichever is the earlier. In the case of persons suffering from telegraphist's cramp, as regards Post Office employees, disablement shall be certified by the Post Office medical officer.

The Order of 30 April 1932 adds to the schedule, "a localised new growth of the skin, papillomatous or keratotic, due to mineral oil affecting workmen engaged in cotton spinning by means of self-acting mules," and lays down certain conditions in regard to victims of such disease. These conditions restrict the payment of compensation which is not accorded:

- (a) unless the workman shall at least one week before the date or commencement of disablement have given notice in writing to the employer from whom the compensation would be recoverable that he is applying to the certifying surgeon for a certificate of disablement, and notice personally or in writing to the certifying surgeon that he is applying for such a certificate;
- (b) for more than fourteen days in all, unless the judge, committee or arbitrator is satisfied that the workman is still disabled at the expiry of the fourteen days.

The employer so notified may require the workman to submit himself for examination by a qualified medical practitioner, provided and paid by the employer, and, if the workman refuses to submit himself to such an examination or in any way obstructs the same, his right to compensation, and to take or prosecute any proceeding under the Act, shall be suspended until such examination has taken place.

Where a workman complains that he is suffering from and disabled by a disease to which the provisions of the Act apply, the employer may agree with the workman that he is liable to pay compensation without requiring the workman to obtain the certificate of the certifying surgeon above referred to, and thereupon the workman shall be entitled to compensation as for injury by accident.

The Order of 3 June 1932 which modified the formula in the second column for cataract, contains special provisions in regard to this affection. These provisions relate to cases in which the judge, committee or arbitrator is satisfied on the advice of the medical referee, that having undergone an operation, the workman is still disabled by the cataract after the expiration of six months from the date of disablement, and stipulate that he shall in such case be entitled to compensation so long as he remains disabled by the cataract.

As regards the occupational diseases included in the schedule appended to the Act of 1925, and in the supplementary Orders, where, after enquiry held on the application of any employers or workmen engaged in any industry in which any of the said occupational diseases may occur, it appears that a mutual trade insurance company or society for insuring against the risks under the provisions of the Act has been established for the industry, and that a majority of the employers engaged in that industry are insured against such risks in the company or society, and that the company or society consents, the Secretary of State may, by provisional Order require all employers in that industry to insure in the company or society. A provisional Order made on those conditions, shall be of no force whatever unless and until confirmed by Parliament.

Compensation shall be recoverable from the employer who last employed the workman during the twelve months previous to the date of death or disablement in the employment to the nature of which the disease was due.

Nevertheless, if the employer alleges that the disease was contracted whilst the workman was in the employment of some other employer he may join such other employer as a party to the arbitration, and if the allegation is proved, that other employer shall be the employer from whom the compensation is recoverable. The workman or his dependants if so required shall furnish the employer with such information as to the names and addresses of all other employers who employed him in the employment during the said twelve months as they may possess. If such information is not furnished or is not sufficient to enable the employer to take proceedings, that employer, upon proving that the disease was not contracted whilst the workman was in his employment, shall not be liable to pay compensation.

If the disease is of such a nature as to be contracted by gradual process, any other employers who, during the said twelve months, have employed the workman in employment to the nature of which the disease was due shall be liable to contribute to the payment of compensation. Such contributions in default of agreement shall be determined by arbitration.

GREECE

Act No. 5733 of 10 October 1932 concerning social insurance. (*Nomos 5733 peri ton Koinónikôn 'Asphaliseôn 10 octobriou 1932.*) (*Ephémēris tēs Kybernéseos*, 1932, Part 1, No. 364, p. 2351.)

The Act of 1932 defines occupational disease as an acute or chronic attack of poisoning or sickness specified in Schedule A, on condition that the insured person has been employed within the two years preceding the occurrence of the poisoning or sickness for the number of days to be specified by regulations in an undertaking specified in Schedule B, and corresponding to the poisoning or sickness from which he is suffering. The schedules in question are as follows:

SCHEDULE A

Diseases and Poisonous Substances

- (a) Poisoning due to lead, its alloys and compounds, with the direct sequelae of such poisoning.
- (b) Poisoning due to mercury, its amalgams and compounds, with the direct sequelae of such poisoning.
- (c) Anthrax infection.

SCHEDULE B

Undertakings

- (a) Handling of ore containing lead, including residues with a lead content in zinc factories;
Casting of old zinc and lead in ingots;
Manufacture of articles made of cast lead or of lead alloys;
Establishments in the polygraphic industry;
Manufacture of lead compounds;
Manufacture and repair of electric accumulators;
Preparation and use of enamels containing lead;
Polishing by means of lead filings or putty powder with a lead content;
Painting operations involving the preparation or manipulation of coating substances, cements or colouring substances containing lead pigments.
- (b) Handling of mercury ores;
Manufacture of measuring and laboratory apparatus;
Preparation of material for the hat-making industry;
Hot gilding;
Use of mercury pumps in the manufacture of incandescent lamps;
Manufacture of fulminate of mercury primers.
- (c) Handling of animal carcasses;
Loading and unloading or transport of merchandise.

The list of diseases specified in Schedule A may be extended by regulations adding other forms of poisoning or other diseases; at the same time the corresponding processes or undertakings shall be added to Schedule B.

Occupational diseases are assimilated to industrial accidents which come within the only existing scheme of social insurance, apart from a few slight exceptions. In the case of temporary incapacity, the benefits paid are similar to those granted under the sickness insurance scheme. In the case of permanent incapacity or death, the payments made are those granted under invalidity insurance or under the scheme of insurance for dependants. These benefits are accorded in cases of industrial accident or occupational disease without any conditions as to qualifying period.

The assessment of pecuniary benefit shall be based on the wage or salary class to which the insured person belonged on the last day of employment.

HUNGARY

(a) Act No. XVI of 3 July 1900, on the insurance fund for workmen and agricultural labourers, etc., and later amendments. (*XVI törvénytzikk a gazdasági munkás és cselédsegely pénztárról. 1900 évi. július hó. 3-án.*) (Orsz. Törvénytas, 7. VII. 1900.)

(b) Act No. 22 of 28 June 1913, concerning the National Insurance Fund for agricultural workers, etc. (*XX törvényezik az Országos Gazdasági Munkáspénzterrol és a gazdasági cselédék, valamint a gazdasági gépmunkások baleset esetére való biztosítása és betegség esetében való ellátása tekintetében irányadó törvényes rendelkezésekről. 1913 évi. június hó. 28-án.*) (Orcz. Törvénylat, 2. VII. 1913.)

(c) Order No. 74302 of 19 August 1923, relative to equality of treatment for agricultural workers belonging to the National Fund, and agricultural workers suffering from certain occupational diseases and insured against accidents. (*A m. kir. földművelésügyi miniszter 74.302 1926. VI. 1 számú, az Országos gazdasági Munkás pénztarhoz intézett rendelete a biztosítottak foglalkozásából eredő (különleges) betegség égének az üzemi balesettel azonos elbírálása tárgyában. 1926. évi. augusztus hó. 19-án.*) (Bud.-P. közlöny, 1926, 197 szám, 2 lap.)

(d) Act No. XXI of 1927, dated 3 August 1927, relative to compulsory insurance in cases of sickness and accident. (*1927. évi XXI törvényezik a betegség és a baleseti kötelező biztosításról. 1927 évi. augusztus hó. 3-án.* 4 (L. S., 1927, Hung. 1.)

(e) Order No. 198 of 13 January 1928, containing the schedule of occupational diseases entitling workmen to compensation against accidents. (*A m. kir. minisztérium 198-1928. M. E. számú rendelete a baleseti kártalanításra igényt ado foglalkozási betegségek jegyzékének megállapítása tárgyában. 1928. évi. januar hó. 13-án.*) (L. S., 1928, Hung. 2.)

(f) Order No. 88,888 of 20 December 1930, containing the schedule of occupational diseases entitling workers to compensation in agriculture. (*A. m. kir. földművelésügyi miniszter 88.888-1930. VI-1 számú rendelete az 1900. XVI. t.-c. és az azt kiegészítő s mblosilo törvényes rendelkezések, vegrehajtása s oran a baleseti kártalanításra igényb ado foglalkozási betegségek megállapítása tárgyában. 1930. évi december hó. án.*) (L. S., 1930, Hung. 4.)

The Act of 1927 extends compensation¹ for industrial accidents to insured workers who contract occupational disease either in an undertaking subject to accident insurance or in course of work executed for an establishment subject to accident insurance. The disease must constitute a special risk involving loss or reduction of earning capacity on the part of the insured worker, or death.

Undertakings subject to the above provisions, as well as those occupational diseases covered in each undertaking, shall be fixed by the Order. The Order of 13 January 1928 which provides the schedule of occupational diseases is none other than a reproduction of the schedule established by the

¹ The manager of the Local Sickness Fund (*Landeskasse*) had, in 1911, proposed assimilation to accidents for purposes of compensation of a number of occupational diseases: poisoning by lead, arsenic, phosphorus, benzene and its derivatives, by mercury, carbon disulphide, nitrous fumes, and ulceration due to chromates, tar (eyes, skin), cancer caused by soot or by paraffin; miners' nystagmus, glassworkers' cataract, injuries due to compressed air, subcutaneous cellulitis, and inflammation of the tendon sheaths.

International Labour Convention of 1925, that is to say poisoning by lead, by mercury, and anthrax infection.

Certain occupational diseases of agricultural workers are compensated under the sickness insurance scheme (Acts of 1900 and 1913). The Order of 19 August 1926 completed by that of 20 December 1930 defines these as anthrax, glanders and diseases of infectious origin; foot and mouth disease, rabies, swine fever, cowpox, itch; and poisoning due to the manipulation of chemical products (superphosphates, basic slag, calcium nitride, hydrochloric and sulphuric acid, germicide powders containing copper, mercury or arsenic, spraying preparations containing copper, sulphur, arsenic, barium chloride, nicotine, carbon disulphide, strychnine, phosphorus, toxic gas, petroleum tar or tar products).

As regards notification of occupational diseases, apart from the provisions common to industrial accidents the Act provides that a medical practitioner on meeting with symptoms of occupational disease in a patient is obliged to notify the local fund within forty-eight hours, or the miners' fund in the case of a miner affected by the disease.

INDIA

(a) An Act to provide for the payment by certain classes of employers to their workmen of compensation for injury by accident. No. VIII of 1923. Dated 5 March 1923. (*L. S.*, 1923, Ind. 1.)

(b) An Act further to amend the Workmen's Compensation Act, 1923. No. 29 of 1926. Assented to 3 September 1926. (*L. S.*, 1926, Ind. 3 A.)

(c) Notification No. L 1125 of the Department of Industries and Labour to add mercury poisoning to the list of occupational diseases and the employments specified in Schedule III of the Workmen's Compensation Act (VIII of 1923). Dated 28 September 1926. (*L. S.*, 1926, Ind. 3 B.)

(d) An Act further to amend the Workmen's Compensation Act, 1923, for certain purposes. No. 5 of 1929. Assented to 29 March 1929. (*L. S.*, 1929, Ind. 3.)

The Act of 5 March 1923 and the amendment of 3 September 1926 stipulates that where a workmen employed in any employment involving the handling of wool, hair, bristles, or animal carcasses, or parts of such carcasses, or in the loading, unloading or transport of any merchandise or any work in connection with animals infected with anthrax, contracts anthrax, this disease shall be deemed to be an injury by accident within the meaning of the Act and unless the employer proves the contrary the

accident shall be deemed to have arisen out of and in course of employment. Besides this certain other diseases regarded as occupational diseases are enumerated in a schedule appended to the Act. This schedule comprises:

Occupational diseases	Employment
Lead poisoning or its sequelae.	Any processes involving the use of lead or its preparations or compounds;
Phosphorus poisoning or its sequelae.	Any processes involving the use of phosphorus or its preparations or compounds;

The notification of 1926 to amend the 1923 Act supplements the schedule by the addition of mercury poisoning and its sequelae caused by any process involving the use of mercury or its preparations or compounds ¹.

IRISH FREE STATE

An Act to consolidate and amend the law with respect to compensation to workmen for injuries received in the course of their employment. 6 Edw. VII, c. 58., 21 December 1906, and later amendments.

The definition of occupational diseases is provided in the Act of 1906 of which Article 8 specifies that when a workman is suffering from one of the diseases mentioned in the third schedule of the Act and his disablement is due to the nature of his employment he may claim compensation in virtue of the Act, the disablement or suspension being treated as the happening of an industrial accident. The schedule in question is as follows:

Description of disease	Description of process
Anthrax.	Handling of wool, hair, bristles, hides, and skins;
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds;
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds;
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds;
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds;
Ankylostomiasis.	Mining.

¹ A Bill, intended to amend the Act of 1923 on workmen's compensation, introduced in 1932 supplements the already existing schedule by the addition of the following occupational diseases: poisoning by benzene and its homologues or its sequelae; ulceration due to chrome or its sequelae; compressed air illness or its sequelae.

ITALY

(a) Act No. 51 of 31 January 1904 concerning occupational accidents and later amendments. (*Legge 31 gennaio 1904, n. 51, per gli infortuni degli operai sul lavoro.*) (L. S., 1921, Part I., It. 1.)

(b) Royal Decree No. 928 respecting compulsory insurance against occupational diseases. Dated 13 May 1929. (*Regio decreto 13 maggio 1929 n. 928. Assicurazione obbligatoria contro le malattie professionali.*) (L. S., 1929, It. 4.)

The question of compensation of occupational diseases was raised in the first instance in the Chamber of Deputies by Mr. Berenini (30 April 1896) and Mr. Prinetti (1 May) who dealt chiefly with compensation for phosphorus necrosis. Later Mr. Bissolati proposed extension of the Bill under discussion in the Chamber to cover occupational diseases: the Bill, that is to say, which was to become the Act of 17 March 1898, No. 80, dealing with compensation for industrial accidents.

A Commission had been appointed in December 1901 with a view to studying the advisability of introducing compensation for occupational diseases in the draft amendment of the 1898 Act placed before the Parliament in 1902. This Commission deemed it advisable to draw up a provisional list of diseases including anthrax, glanders, poisoning by lead, phosphorus, mercury, arsenic, carbon disulphide, benzene, nitro-benzene as well as toxic and irrespirable fumes. The Chamber in 1902 (17 April) and the Senate in 1903 (23 April) invited the Government to present a Bill on compulsory insurance against "workers' diseases due to any cause whatsoever". Similar to the proposal of the 1902 Commission this invitation was not followed up. Since then, however, a number of proposals dealing with compensation for occupational diseases have been placed before the Chamber by Messrs. Cabrini (1901, 1909), Celli (1902, 1903), Queirolo (1909), Pieraccini (1910), etc. Meanwhile judicial interpretations of the definition of accident were sufficiently comprehensive with the result that the provisions of the Act of 31 January 1904 (No. 51), replacing that of 1898 on accident compensation, made it possible to include certain diseases and in particular certain forms of infection, namely anthrax and plague.

It should be noted that for many years past this system had been applied to occupational diseases occurring amongst workers in arsenals and military establishments.

Further, State employees on the railways enjoyed compensation for occupational diseases enumerated in a schedule and including those due to chronic forms of poisoning; chronic forms of respiratory disease caused by inhalation of fumes or dust; chronic poisoning due to toxic gas; cophosis due to noisy work; recurring dermatitis (erythema, eczema amongst workers handling exotic woods and engaged in impregnating them with tar products); cutaneous infection of the hands due to prolonged action of corrosive substances, retinal asthenopia and other ocular lesions amongst electricians, welders, foundry workers, etc.; mogigraphy and occupational cramp; Dupuytren's disease, compressed air disease.

According to the Decree of 1929¹ there are considered as occupational diseases those enumerated in the schedule appended to the said Decree and which have been contracted during employment in and on account of certain processes specified for each of the diseases in the same schedule, provided that such processes are liable to compulsory insurance against accidents. The schedule may be modified or completed by Royal Decree on the proposal of the competent Minister in conjunction with the Minister of the Interior and of the Corporations after notification to the section for industry and social insurance of the Superior Council of National Economy.

The schedule is as follows:

Diseases	Processes	Maximum period within which compensation is payable after cessation of employment
(1) Poisoning by lead, its alloys or compounds and its sequelae.	(a) Handling of minerals containing lead, including residues containing lead in zinc factories.	One year.
	(b) Casting of old zinc and lead in ingots.	
	(c) Manufacture of articles made of lead or of lead alloys.	
	(d) Processes in the polygraphic industries in which lead or lead alloys are used.	
	(e) Manufacture of lead compounds.	
	(f) Manufacture and repair of electric accumulators.	One year.

¹ This Decree, which has the force of an Act (in virtue of the Act of 13 December 1928, No. 2832), comes into force one month after the publication of the Regulations in application thereof.

Maximum period within which compensation is payable after cessation of employment

Diseases	Processes	
(1) Poisoning by lead, its alloys or compounds and its sequelae.	(g) Preparation and use of enamels and varnishes containing lead. (h) Polishing by means of lead filings or paste with a lead content. (i) Painting operations involving the preparation and manipulation of coating substances, cements or colouring substances containing lead pigments.	One year.
(2) Poisoning by mercury, its amalgams and compounds and its sequelae.	(a) Handling of mercury ore, down to the bottling of the metal. (b) Manufacture of mercury compounds. (c) Manufacture of measuring and laboratory apparatus containing mercury. (d) Preparation of raw materials for the hat-making industry (carrotting of fur for hats). (e) Hot gilding involving the use of mercury. (f) Use of mercury pumps. (g) Manufacture of fulminate of mercury primers. (h) Silvering of mirrors with mercury.	One year.
(3) Poisoning by white or yellow phosphorus and its sequelae.	(a) Manufacture of fireworks and miners' tinders with white phosphorus.	Two years.
(4) Poisoning by carbon disulphide and its sequelae.	(a) Manufacture of carbon disulphide. (b) Extraction of oils, fats, essences or resins by means of carbon disulphide. (c) Manufacture of cellulose and subsequent processes preceding spinning in artificial silk factories. (d) Vulcanisation by the cold process and the preparation of rubber solution with carbon bisulphide.	One year.
(5) Poisoning by benzene and its homologues, or by nitro and chloro derivatives of benzene and their homologues, with its sequelae.	(a) Manufacture of benzene and its homologues and of nitro and chloro derivatives of benzene and their homologues. (b) Processes in which rubber solution with benzene is employed. (c) Manufacture of perfumes and soaps in which benzene derivatives are used.	One year.
(6) Ankylostomiasis.	(a) Work in mines, tunnels and brick-kilns.	Six months.

Anthrax infection shall be deemed to be an industrial accident for the purposes of the Act of 31 January 1904, Article 14, and of the Decree No. 1450 of 23 August 1917.

Notification of the disease must be lodged within a fortnight of its appearance, on pain of disallowance of the right to compensation for the period prior to the notice. The notice shall be given by the worker to the employer who shall transmit it within the next five days to the insurance carrier together with a medical certificate. Benefits in cases of temporary total incapacity are due as from the tenth day of incapacity. Benefit in the case of permanent incapacity shall be due when the working capacity is reduced by not less than 20 per cent.

Compensation shall be due even if the employee has ceased to be employed in the processes in respect of which the right to compensation is allowed provided that incapacity for work or death occurs within the time limit specified in respect of each disease in the schedule. Compensation shall also be due in case of the recurrence of a disease for which compensation has previously been paid or for which compensation would have been paid in pursuance of this Decree, if such recurrence takes place within the period of three years of the cessation of employment in the processes which caused the disease.

Compensation shall not be due for occupational diseases which have already made their appearance before the date of the coming into operation of this Decree or which appear subsequently within six months of the said date. In like manner compensation shall not be due in respect of occupational diseases appearing in employees who ceased before the date of the coming into operation of the 1929 Decree to be employed in the processes for which insurance is compulsory.

Compensation for every case of total permanent incapacity and for cases of partial permanent incapacity in which the working capacity is reduced by not less than 50 per cent. shall be paid by the insurance carrier to the National Social Insurance Institution which shall allocate benefits as follows: Until the expiration of the period for revision of the benefit, viz. three years from the appearance of the disease or until the issue of a final award the National Social Insurance Institution shall pay the employee a monthly allowance equal to the life pension corresponding to the compensation allocated to him. On the expiration of the time limit above-mentioned the compensation

originally granted (decreased or increased as the case may be in pursuance of the award in case of review and subject to deductions of the sums already paid in the form of a monthly allowance) shall be converted into a life pension on the basis of tables approved by a Decree of the Minister of National Economy, provided that the commutation of all or part of the balance of the benefit for a capital sum shall not in any case be authorised. If the employee dies before the expiration of a period of three years from the date of the appearance of the occupational disease and before the issue of the award in case of review (if any), the compensation originally granted, subject to the deduction of the sum already paid as a monthly allowance, shall be paid to the surviving dependants in virtue of the 1904 Act, Article 10, or in default of such dependants to the special fund mentioned in the said Act (Article 37).

The right to bring an action for the purpose of obtaining compensation shall lapse one year from the appearance of the disease. Application may be made for a review of the compensation within three years reckoned from the appearance of the disease by the employee suffering from the disease and by the insurance carrier, exclusively on the ground of changes which have occurred in the physical condition of the employee as a result of the disease. In the event of the death of the employee before the expiration of three years an application may be made for a review of the compensation by the surviving dependants in virtue of the 1904 Act (Article 10) and by the insurance carrier provided that such application must be made within two months from the date of the death and in any case within the aforesaid time limit of three years from the appearance of the disease on pain of disallowance.

The expense of medical treatment required by the employee shall be paid by the insurance carrier. The employee shall be bound to undergo what treatment the insurance carrier considers necessary and for this purpose to enter the curative institutions specified by it. In case of unjustifiable refusal the employee shall forfeit all rights to compensation.

The insurance carrier authorised to undertake insurance of employees against industrial accidents within the meaning of the Act of 1904 and subsequent amendments shall provide for the branch of insurance instituted by the Decree of 1929 by an increase in the contribution or premium paid by employers for

accident insurance. When an employer insures his employees against industrial accidents he shall at the same time notify the insurance carrier with which he contracts the aforesaid insurance of the processes specified in the schedule appended to the 1929 Decree with all the information and particulars which the insurance carrier may request for this purpose.

Every medical practitioner who becomes aware of the presence of an occupational disease included in the list approved by a Decree issued by the Minister of National Economy in agreement with the Minister of the Interior after consultation with the Superior Public Health Council shall be bound to give notice of such disease.

The notice shall be given to the district industrial and labour inspection office competent for the locality.

ITALIAN REGULATIONS

The Draft Administrative Regulations in application of the Decree of 1929, granting compensation for certain occupational diseases, were submitted in April 1933 to the Committee on Labour Legislation and to the Special Permanent Committee on Labour Legislation, Welfare, Social Insurance and Co-operation attached to the National Council of Corporations.

The provisions of the Accident Compensation Act of 1904 remain valid where the regulations contain no indication to the contrary.

The inspection service may extend the benefits of insurance to workers who though not engaged in processes covered by the Schedule appended to the Decree, work in the same establishment or workshop and may thus be exposed to the risks covered by compensation.

The clinical disease forms enumerated in the schedule of the Regulations may be modified or supplemented by Ministerial Order, in accordance with the suggestions of the Permanent Committee for Labour Legislation.

The date on which the worker is first obliged to absent himself entirely from work on account of illness shall be recognised as the date of the outbreak of the disease.

If the disease occurs after the worker has left the process in question the date shall be that on which the certificate was addressed to the insurance carrier.

Total or partial reduction of working capacity shall be assessed in its relation to work in general and not to the particular occupation of the patient.

In the case of permanent incapacity, the degree of which may be reduced by permanent or temporary cessation of the type of work in the course of which the injury occurred, and to the nature of which it was due, provided that the worker does not intend to give up the work in question, the indemnity due shall be based on the lesser degree of incapacity which might be presumed to occur by abandoning permanently or temporarily the process in question.

A relapse in the case of a disease previously compensated entitles the worker to benefit for absolute temporary incapacity. In the case of a relapse for which compensation has not been granted, but in regard to which the patient is entitled to compensation under the Decree, such relapse shall be considered exactly as if it were the first outbreak of the disease.

The worker must submit to such medical examinations as may be considered necessary by the insurance carrier.

Disagreement relative to the treatment of a patient between the medical practitioner called in by the worker and the insurance doctor shall be submitted for decision to a third doctor, with the consent of the two parties or in the absence of such consent by the President of the Registered Physicians for the district in question.

The rate of contributions payable is revised at most every five years.

The medical certificate which must accompany a notification of the disease to the insurance carrier shall be delivered by the doctor attending the worker or by the factory doctor required to examine the worker. The certificate must contain an analysis of the symptoms found by the medical man or alleged by the worker.

The insurance institution has the right to demand from the doctor all information considered necessary. It is entitled to receive information relative to the results of medical examinations, whether preventive or periodical, provided that if in course of such examinations there is noted in the case of a worker engaged in any of the processes enumerated the presence of symptoms cited in the schedule appended to the Regulations, the employer in question is bound to inform the insurance

carrier whether or not the case is subject to compulsory notification.

In the case of death the dependants must inform the insurance carrier by telegraph within a delay of twenty-four hours of the occurrence. The insurance carrier or the dependants are entitled to demand an autopsy. Refusal of this on the part of the dependants constitutes a presumption prejudicial to the right to compensation.

The employers are obliged to submit to the insurance carrier on a special form all the facts necessary for determining and assessing the risk in question.

Nomination of experts in case of litigation is based on a choice drawn from University lecturers, medical men specially qualified in industrial medicine, or in default of these from particularly competent medical men.

The Central Accident Records Office established by the Decree No. 387 of 23 March 1922 is extended to cover occupational diseases.

The Permanent Commission for Labour Legislation, Welfare, Social Insurance and Co-operation attached to the National Council of Corporations is entrusted with the task of making recommendations relative to modifications in the schedules appended to the Decree and to the Regulations, as well as on all questions of a medical and technical nature connected with the prevention of occupational disease. With this in view its members comprise the Director-General of Public Health, the Chief of the Corporative Medical Inspection Department, three representatives of the Superior Health Council, and three experts on industrial hygiene or industrial medicine, appointed by the Minister of Corporations.¹

A schedule of diseases entitling to compensation is annexed to the Order¹.

JAPAN

(a) Factory Act No. 46 of 28 March 1911, and its later amendments. (*Hôritsu dai 46 gô: Kôjô-Hô, 28 March 1911.*)

(b) Imperial Ordinance No. 193 of 2 August 1916, in administration of the Factory Act and its later amendments. (*Chokurei dai 193 gô: Kôjo-Hô Shikô Rei, 2 August 1916.*)

(c) Act No. 45 of 8 March 1905 on mines, and its later amendment (*Hôritsu dai 45 gô: Kôgyo-Hô, 8 March 1905.*)

¹ At the moment of going to press, we have received information that the draft regulation was approved on 16 september 1933.

(d) Regulation No. 21 of 3 August 1916, respecting relief of miners, and its later amendments. (*Nôshômu-Shô-Rei dai 21 gô: Kôfu Rôyeki Fujô Kisôku*, 3 August 1916.)

(e) Imperial Ordinance No. 382 respecting relief of employees. Dated 21 November 1918, and its later amendments. (*Chokurei dai 382 gô: Yôjin Fujô Rei*, 21 November 1918.)

(f) Act No. 54 concerning the relief of workers in case of accident. Dated 1 April 1931. (*Hôritsu dai 54 gô: Rôdô Saigai Fujô Hô*, 1 April 1931.) (L. S., 1931, Jap. 1.)

(g) Imperial Ordinance No. 276 respecting the administration of Act No. 54 of 1 April 1931. Dated 27 November 1931. (*Chokurei dai 276 gô: Rôdô-sha Saigai Fujô Hô Shika Rei*, 27 November 1931.)

(h) Imperial Ordinance No. 2 concerning the relief of workers supplied by contract. Dated 7 January 1932. (*Chokurei dai 2 gô: Kyoku Rôdô-sha Fujô Rei*, 7 January 1932.)

The Factory Act of 1911, as amended, provides that if a worker is injured, falls sick, or dies in the course of his work, the employer shall grant relief to him, or his family or dependants in the case of death, in accordance with the regulations to be issued by Imperial Ordinance.

Act No. 45 of 1905, dealing with mines, the Imperial Ordinance No. 382 of 1918 respecting relief of employees, and Imperial Ordinance No. 276 of 1931 respecting the administration of the Act concerning relief of workers in case of accident, contain provisions in application of the above principle, affecting respectively miners, Government employees and workers coming within the 1931 Act.

Finally, Imperial Ordinance No. 2 of 1932 contains similar provisions for Government employees by virtue of a special contract in an establishment coming within the Factory Act No. 46 of 1911, the Act No. 45 of 1905 dealing with mines, or the Act No. 54 of 1931 dealing with industrial accidents.

The Imperial Ordinance of 2 August 1906, as amended, obliges the employer to furnish at his own expense medical attention for the sick or injured worker. On the other hand, this Order fixes the benefits to be paid as compensation.

The following are considered to be "occupational diseases" in terms of Japanese legislation:

1. Poisoning due to arsenic, mercury, or their compounds, phosphorus, and phosphorus compounds, lead and lead compounds, hydrocyanic acid and its compounds, as well as other harmful or toxic substances.
2. Caustic burns or ulcerations, due to mineral acids, alkalis, chlorine and its compounds, fluorine and its compounds, chrome derivatives, tar and other caustic or irritant substances used in industry.
3. Dermatitis of the fingers due to handling of raw silk, grinders' eczema and eczema amongst workers handling tar, cement, and hydrocyanic acid compounds, etc.

4. Cramp, convulsions, lacerations, inflammations of the tendon sheaths, arthritis and occupational hernia.

5. Conjunctivitis or other ocular affections due to manipulation of material at high temperatures and of irritant gases and other substances (dust).

6. Erysipelas, anthrax, plague, smallpox due to contact with rags, animal hair, skins, and other refuse.

7. Other diseases considered as resulting from employment.

Imperial Ordinance No. 276 of 1931¹ provides that the employer may deduct from the amount of relief due to a worker who has suffered or died as the result of a disease or accident in the course of his employment the amount which such worker has received for damages from the same cause in virtue of the provisions of the Civil Code.

The assistance referred to in the above paragraph shall be in one of the following:

1. Sickness caused by wounds.

2. Eye diseases caused by external objects, inflammation of tendon sheaths caused by handling heavy objects, and other sicknesses caused by accidents.

3. Poisoning or injuries of the skin or mucous membrane caused by poisonous, caustic or irritant substances.

4. Sickness caused by sudden changes of atmospheric pressure.

5. Eye diseases caused by injurious rays of light.

6. Any other sickness specified by the Minister of the Interior.

Miners' nystagmus is deemed to be an occupational disease (circular No. 279 of 10 September 1929 issued by the Director of the Labour Department) when it is obvious that the disease is due to work in mines, or when the worker in question has been employed in mining for at least three years.

Finally compensation is payable for silicosis, in accordance with provisions of the circular letter No. 154 of 3 June 1930, issued by the Director of the Labour Department, subject to certain conditions (duration of employment of at least three years in mining).

¹ The Japanese Government has been considering the need of codifying the laws and regulations relative to compensation for industrial accidents. Factory workers are mainly covered by the Factory Act, mining workers by the Regulations concerning the employment and relief of miners, and most outdoor workers by the Act for the Relief of Workers in case of Accident.

The Bureau of Social Affairs is now preparing such a codifying Bill for submission to the next session of the Diet. Further, the provisions of the same Act relating to sickness, in virtue of the 1931 Act, will be expanded and the occupational diseases giving rise to compensation enumerated. The amended Act on Occupational Diseases was to come into force on 1 July 1933.

LATVIA

Act concerning insurance of paid employees against accident and occupational diseases and its later amendments. Dated 1 June 1927. (*Likums par algotu darbinieki apdrošināšanu nelaimes un arodu slimību gūdiņumos 1927. g. 1 jūnija.*) (L. S., 1927, Lat. 1.)

The definition of occupational diseases is given in the Act of 1927. There are considered as occupational diseases those diseases enumerated in the Convention on compensation for occupational diseases adopted by the International Labour Conference and ratified by Latvia. The Act contains a statement to the effect that the Ministry of Social Welfare shall publish a schedule of occupational diseases.

The industries covered by the provisions relative to occupational diseases under the Act of 1927, are the same as those covered in the case of industrial accidents with the exception of workers engaged in agriculture.

LUXEMBURG

(a) Act of 17 December 1925, relative to the Social Insurance Code and its later amendments. (*Loi du 17 décembre 1925 concernant le Code des assurances sociales et ses modifications ultérieures.*) (L. S., 1925, Lux. 2.)

(b) Grand Ducal Order respecting the extension of compulsory accident insurance for occupational diseases. Dated 30 July 1928. (*Arrêté Grand-Ducal du 30 juillet 1928, concernant l'extension de l'assurance obligatoire contre les accidents aux maladies professionnelles.*) (L. S., 1928, Lux. 1.)

The Order of 1928 extends compulsory insurance for accidents to cover certain occupational diseases. These are as follows:

1. Poisoning by lead, its alloys or compounds, and its sequelae.
2. Poisoning by mercury, its amalgams and compounds, and its sequelae.
3. Anthrax infection.

In virtue of Article 6 the medical practitioner attending an insured person suffering from any of these diseases shall at once notify the Accident Insurance Association.

This Association shall prescribe the procedure for enquiries and shall cause every individual case of occupational disease to be examined by a medical practitioner or practitioners ap-

pointed by it. The presence and nature of the occupational disease shall be established by a declaration of the medical practitioner and by repeated observation of the case during the period of two consecutive months. The results of the observation shall be embodied in two reports drawn up with one month's interval between them. The enquiry shall be based on the continuous or repeated observations of the case during the aforesaid period of two months. The duration of the period of observation may be extended and the number of reports and enquiries increased in special cases.

The 1928 Order provides for the setting up of a Superior Commission on Occupational Diseases.

MANDATED TERRITORY OF SOUTH-WEST AFRICA

Workmen's Compensation (Accident and Industrial Diseases) Proclamation No. 27 of 1924, issued by the Administrator on 15 November 1924, and subsequent amendments. (*L. S.*, 1924, *L. of N.* 6A.)

The Proclamation of 15 November 1924, assimilates to industrial accidents a certain number of diseases arising out of and in the course of occupation and enumerated in the following schedule. They are as follows:

Description of disease	Description of work
Cyanide rash.	The handling of cyanide or any work involving the use of cyanide.
Lead poisoning or its sequelae.	The handling of lead or its preparations or compounds or any work involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any work involving the use of mercury or its preparations or compounds.

MEXICO (UNITED STATES OF)

Federal Labour Act. Dated 18 August 1931. (*Ley federal del Trabajo, 18 de agosto de 1931, art. 286 e. art. 326.*) (*L. S.*, 1931, *Mex.* 1.)

For the purposes of the Federal Labour Act of 1931, "occupational disease" shall mean any pathological condition due to a cause repeated during a long period of time, being the

inevitable consequence of the class of work performed by the employee or the environment in which he is obliged to work, which gives rise to an injury or functional disturbance in the organism, whether permanent or temporary; the origin of such occupational disease may be due to physical, chemical or biological factors. A schedule (Article 326) contains an enumeration of the diseases in question. It is as follows:

I. Anthrax: tanners, rag-workers, woolcombers, shepherds and fur dressers, persons employed in handling horsehair, bristles, and the horns, flesh and bones of cattle.

II. Glanders: grooms, stablemen, persons in charge of herds of horses.

III. Ankylostomiasis: miners, brickmakers, potters, navvies, gardeners and workers in sand pits.

IV. Actinomycosis: bakers, wheat, barley, oats and rye millers, agricultural workers.

V. Leishman's disease: chicle collectors, rubber collectors, vanilla workers and lumbermen in the tropical districts.

VI. Syphilis: glassblowers (Primary stage: mouth sore), medical practitioners, nurses, operation theatre attendants (on the hands).

VII. Anthracosis: miners (in coal mines), charcoal burners, stokers using coal, chimney sweeps.

VIII. Tetanus: grooms, butchers, stablemen and cattlemen.

IX. Silicosis: miners (mineral and metalliferous mines), quarry workers, lime burners, cement factors workers, grinders and masons, workers in sandpits, workers employed in chinaware factories.

X. Tuberculosis: medical practitioners, nurses, operation theatre attendants, butchers and miners, when silicosis has been incurred previously.

XI. Siderosis: ironworkers (file cutters, metal turners and persons engaged in handling oxide of iron).

XII. Tabacosis: persons employed in the tobacco industry.

XIII. Other lung diseases due to the inhalation of dust: carpenters, persons employed in the cotton, wool, jute, silk, skin and feather industries: persons employed in burning off paint by means of a blowlamp, painters and cleaners using compressed air (sprayers).

XIV. Dermatitis: sugarcane harvesters, vanilla workers, flax spinners, gardeners.

XV. Affections of the skin due to physical agents:

Heat: smiths, smelters, glassworkers, stokers;

Cold: workers employed in cold storage chambers;

Solar rays: work in the open air;

Electric rays: X-rays;

Mineral rays: radium.

XVI. Other affections of the skin: persons employed in handling paints containing vegetable pigments, a basis of metallic salts or aniline products; cooks, dish washers, washerwomen, miners, bleachers of linen, persons employed in handling spices, photographers, masons, quarry workers, cement workers, cabinet makers, varnishers, persons employed in the extraction of grease from rags, fullermen, textile bleachers using sulphur fumes, tawers, wool spinners and collectors, persons employed in the manufacture of chlorine by means of the electrical decomposition of chloride of sodium, persons engaged in handling petroleum and petrol.

XVII. Effects of other physical agents which cause diseases:

Humidity: on persons employed in places where water is present in considerable quantities, e. g. rice sowers;

Compressed air or lack of air: on divers, miners, persons employed in badly ventilated places other than places in which noxious fumes are generated.

Eye and Ear Diseases

XVIII. Electrical ophthalmia: persons employed in autogenous welding, electricians.

XIX. Other kinds of ophthalmia: persons employed under a high temperature: glassworkers, tinplate workers, smiths, etc.

XX. Sclerosis of the middle ear: workers employed in copper rolling and in grinding minerals.

Other Diseases

XXI. Housemaid's knee: persons who work as a rule in a kneeling position.

XXII. Occupational cramp: clerks, pianists, violinists and telegraphists.

XXIII. Occupational deformation: shoemakers, carpenters, masons.

XXIV. Ammonia: persons employed in the distillation of coal and in the preparation of agricultural fertilisers, cesspool cleaners, well diggers, miners, ice makers and printers.

XXV. Hydrofluoric acid: glassworkers, engravers.

XXVI. Chlorine fumes: preparation of chloride of lime, persons employed in bleaching, preparation of hydrochloric acid, chlorides and soda.

XXVII. Sulphurous anhydride: sulphuric acid makers, dyers, wallpaper manufacturers and printers.

XXVIII. Carbon monoxide: boiler-makers, mineral and metal smelters (blast furnaces) and miners.

XXIX. Carbon dioxide: the same workers as those mentioned under carbon monoxide, and in addition well diggers and cesspool cleaners.

XXX. Arsenic and arsenic poisoning: persons employed in arsenic works and mineral and metal smelting, dyers and other persons handling arsenic.

XXXI. Lead and lead poisoning: persons employed in mineral and metal smelting, painters using white lead, printers, makers of tins for preserved food products, and persons employed in handling lead and its derivatives.

XXXII. Mercury and mercury poisoning: miners employed in mercury mines and other persons employed in handling mercury.

XXXIII. Sulphuretted hydrogen: miners, cistern cleaners, sewer-men, persons employed in cleaning furnaces and pipes in industrial establishments, retorts and gasometers; persons employed in the illuminating gas industry and wine makers.

XXXIV. Nitrous fumes: persons employed in the manufacture of nitric acid and printers.

XXXV. Carbon disulphide: persons employed in the manufacture of this product, rubber vulcanising, and the extraction of grease and oil.

XXXVI. Hydrocyanic acid: miners, persons employed in the smelting of minerals and metals, photographers, blue dyers, and persons engaged in the manufacture of soda.

XXXVII. Colouring essences, hydrocarbons: perfume makers.

XXXVIII. Carburetted hydrogen: distillation of coal and petroleum, preparation of varnishes and all uses to which petroleum and its derivatives are put: coal miners, petroleum workers, stokers, etc.

XXXIX. Alkaline chromates and bichromates: persons employed in preparing chrome pigments; in wallpaper factories; coloured pencil factories, ink factories and dyeworks; persons employed in the preparation of chromium and its compounds, the manufacture of fuses, explosives, gunpowder, pyroxyline powder for sporting guns, Swedish matches; persons employed in the textile industry in waterproofing cloth.

XL. Epithelial cancer caused by paraffin, tar and similar substances.

NETHERLANDS

(a) Decree promulgating the text of the Act of 2 January 1901 as amended and supplemented by subsequent Acts. Dated 28 June 1921.

(*Besluit van den 28sten Juni 1921, ter bekendmaking van den tekst der wet van 2 Januari 1901, zooals die wet is gewijzigd en rangevuld etc.*) (L. S., 1921, Part. 2, Neth. 1.)

(b) Royal Decree issuing public administrative regulations as provided in section 82 of the Labour Act of 1919. Dated 4 October 1920.

(*Besluit van den 4 Oktober 1920, tot vaststelling van een Algemeenen Maatregel van Bestuur als bedoels bij artikel 82 der Arbeidswet 1919.*) (L. S., 1920, Neth. 7.)

(c) Royal Decree to amend the foregoing Royal Decree of 4 October 1920. Dated 3 March 1924.

(*Besluit van den 3den Maart 1924, tot wijziging van het koninklijk besluit van den 4 Oktober 1920 etc.*) (L. S., 1924, Neth. 1.)

(d) Act to amend the Accidents Act, 1921. Dated 12 May 1928. (*Wet van den 12 den Mei 1928, tot wijziging der ongevalwet 1921.*) (L. S., 1928, Neth. 1A.)

(e) Act to amend the Accidents Act, 1921. Dated 2 July 1928. (*Wet van den 2 den Juli 1928 tot wijziging der Ongevalwet 1921.*) (L. S., 1928, Neth. 1B.)

(f) Royal Decree to issue public administrative regulations in application of the Accidents Act, 1921. Dated 20 August 1928.

(*Besluit van 20sten Augustus 1928, tot vaststelling van en algemeen maatregel van bestuur etc.*) (L. S., 1928, Neth. 1D.)

(g) Royal Order of 21 December 1928, amending the Royal Order of 4 October 1920.

(*Besluit van den 21sten December 1928 tot nadere wijziging van het Koninklijk Besluit van 4 Oktober 1920 etc.*) (*Staatsblad*, 1928, No. 492.)

(h) Act to amend the Act of 2 July 1928 to amend the Accidents Act, 1921. Dated 7 February 1929.

(*Wet van den 7 den Februari 1929, tot wijziging van de wet van 2 Juli 1928, tot wijziging der Ongevalwet 1921.*) (L. S., 1929, Neth. 2 B.)

(i) Royal Order of 9 February 1929 amending the Royal Order of 20 August 1928.

(*Besluit van den 9 den Februari 1929 tot wijziging van het Koninklijk Besluit van 20 Augustus 1928.*) (*Staatsblad*, 1929, No. 41.)

The definition of occupational diseases is given in the Act of 2 July 1928 which assimilates these diseases to accidents on condition that they are the result of the performance of the operations specified in the Act. Unless anything appears to the contrary the disease shall be deemed to be the result of the

performance of the operations mentioned in the Act if it declares itself after such performance within a time limit fixed by public administrative regulations.

If a worker has performed the operations specified in two or more employments consecutively within the time limit so fixed, the disease shall be deemed to be the result of the operations performed in the employment last entered. Nevertheless, the disease may be deemed the result of the operations performed in the last employment but one if it declares itself within a time limit fixed by public administrative regulations after the beginning of the last employment.

The Act of 2 July 1928 contains a list of occupational diseases to which the above definition shall apply and specifies the processes in which these diseases shall occur in order to fulfil the conditions required under the Act. They are:

- (a) poisoning by lead, its compounds or alloys, and the sequelae of such poisoning, provided that the poisoning is a consequence of the following operations:
 - handling of ores containing lead, including ashes containing lead from zinc factories;
 - casting of old zinc and lead in ingots;
 - manufacture of articles made of cast lead or of lead alloys;
 - employment in the polygraphic industries;
 - manufacture of lead alloys;
 - manufacture and repair of electric accumulators;
 - preparation and use of enamels containing lead;
 - polishing with lead filings or putty powder with a lead content;
 - performance of painting operations, including the preparation and manipulation of primings, putty or pigments containing lead;
- (b) poisoning by mercury, its amalgams and compounds, and the sequelae of such poisoning, provided that the poisoning is a consequence of the following operations:
 - handling of mercury ore;
 - manufacture of mercury compounds;
 - manufacture of measuring and laboratory apparatus;
 - preparation of raw materials for the hat-making industry;
 - hot gilding;
 - use of mercury pumps in the manufacture of incandescent lamps;
 - manufacture of fulminate of mercury primers;
- (c) anthrax, if it is a consequence of:
 - contact with animals infected with anthrax;
 - handling of animal refuse;
 - loading and unloading or transport of merchandise;
- (d) ankylostomiasis (miners' hookworm disease), if it is a consequence of underground work in mines¹.

¹ Section 1 of the Accidents Act (text of 1921) has been completed by the following additional paragraph:

"Bodily injuries which develop in a comparatively short time such as inflammation of the tendon sheaths; frostbite, heat strokes, heat exhaustion, sunstroke, blistering and the like shall be deemed to be equivalent to bodily injuries caused by an accident."

The Order of 9 February 1929 fixes the delay for production of the disease above referred to at twelve months in cases of affections included under paragraphs (a) and (b) and at fourteen days for those under paragraph (c).

It is further provided that, where the victim of an occupational disease has contracted the disease in several consecutive employments, the disease shall be attributed to the last occupation but one when the delay between the beginning of the last occupation and the date at which the disease occurred is less than half that during which the victim has been employed in all subsequent employments during the period of delay.

As regards the delay of fourteen days, it is further stipulated that the last employment but one shall mean that immediately preceding the employment in course of which the disease occurred.

Notification is required by Article 21 of the Labour Act of 1911.

NEW ZEALAND

(a) An Act to consolidate and amend the law with respect to compensation to workers for injuries suffered in the course of their employment. No. 39, 31 October 1922 and later amendments. (*L. S.*, 1926, N.Z. 2, Appendix.)

(b) Order-in-Council declaring chrome ulceration to be a disease within the operation of the Workers' Compensation Act 1922. Dated 6 April 1925. (*N. Z. Gazette*, April 1925, p. 1059.)

The Act of 1922 assimilates occupational diseases to accidents and considers as such anthrax, lead poisoning, mercury poisoning, phosphorus poisoning, arsenic poisoning and any other diseases which are declared by the Governor-General by Order-in-Council gazetted to be diseases within the operation of this Act. In virtue of this provision the Order of 1925 adds to the list of occupational diseases chrome ulceration.

The rights of victims of occupational disease are similar to those of the victims of industrial accidents on condition that the disease has been contracted in the twelve months preceding incapacity, provided that such incapacity commences within twelve months after the worker has ceased to be employed on the employment to which the disease is attributed.

Nothing in this section of the Act shall affect the right of any person to recover compensation in respect of a disease to which this section does not apply, if the disease is a personal injury by accident within the meaning of the Act.

The worker is entitled to the same benefits as the victim of an industrial accident. Benefits are calculated on the basis of the average weekly earnings and in the case of occupational diseases the commencement of the incapacity of the worker (or the date of his death if there has been no previous incapacity) shall be treated as the date of the happening of the accident, if he is then employed by the employer from whom the compensation is claimed, in any employment to which the Act applies and to the nature of which the disease is due; and if he is not then so employed, the last day on which he was so employed shall for this purpose be treated as the date of the happening of the accident.

The employer who last employed the worker is liable for the payment of compensation. If the disease has been contracted by a gradual process so that two or more employers are severally liable to pay compensation, the aggregate amount of compensation recoverable shall not exceed the amount that would have been recoverable if those employers had been a single employer, but in default of agreement the employers involved shall be entitled as between themselves to such rates of contribution as the court of arbitration thinks just, having regard to the circumstances of the case.

NICARAGUA

Act on Compensation for Industrial Accidents. Dated 13 May 1930. (*Ley de accidente del trabajo, 13 de mayo de 1930.*) (L. S., 1930, Nic. 1.)

Occupational diseases are assimilated to industrial accidents and included in a general definition which considers as such any bodily injury suffered by a worker in the course of and in consequence of his employment. In the case of occupational disease, the disease must have been contracted exclusively as the result of the nature of employment effected during the year preceding the commencement of disablement.

NORWAY

(a) Act of 13 August 1915, relative to workmen's accident compensation and its later amendments. (*Lov om Ulykkesforsikring for Industriarbeidere m. v. av. 13 august 1915.*) (*Almindelig Norsk Lovsamling*, 1912-15, p. 1151.)

(b) Royal Resolution of 7 December 1928. (*Kongelig resolusjon II. 7 desember 1928.*) (*Norsk Lovtidende*, 1928, No. 46, p. 729.)

(c) Royal Resolution of 20 December 1929. (*Kongelig resolusjon. 20 september 1925.*) (*Norsk Lovtidende*, 1929, No. 39, p. 609.)

In virtue of the Act of 22 June 1928 amending the Act of 13 August 1915 on Accident Insurance, occupational diseases are assimilated to accidents. The Royal Resolution of 7 December 1928 provides a schedule of diseases which includes:

1. Poisoning by lead, its alloys and compounds.
2. Poisoning by mercury, its amalgams and compounds.
3. Poisoning by phosphorus and its compounds.
4. Anthrax infection.

The Royal Resolution of 20 November 1929 supplements this list by the addition of poisoning by benzene and its homologues.

PARAGUAY

Act No. 926 respecting Industrial Accidents. Dated 7 September 1927. (*Ley no. 926, accidentes del trabajo, 7 de setiembre de 1927.*) (L. S., 1927, Par. 1.)

The Act of 1927 stipulates that when an employee becomes incapacitated for work or dies in consequence of a disease contracted in the exercise of his trade or employment, he shall be entitled to the compensation accorded in case of accident. The Act also states that a schedule of occupational diseases shall be issued by the Executive.

The occupational disease must be certified to be due solely to the kind of work performed by the victim during the year preceding the incapacity. The rights of the victim in case of occupational disease are similar to those in case of industrial accidents unless it is proved that the employee suffered from the disease in question before engaging in the occupation which he has had to give up.

As regards payment of benefits, besides the benefits accorded in the case of accidents, the employee shall be entitled to receive 15 per cent. of the total amount of the compensation as a first instalment thereof. If the compensation is less than ten thousand pesos he shall be paid in a lump sum.

Compensation shall be paid by the last employer for whom the employee worked during the twelve months preceding incapacity in the occupation which caused the disease unless it is proved that the disease was contracted in the service of other employers, who shall in that case be notified. If the disease could be contracted gradually owing to its nature, the employer who employed the victim during the last year in the

kind of work which caused the disease shall be bound to refund to the last employer a proportionate share of the compensation paid by him; the proportion shall be fixed by arbitrators in case of dispute respecting it.

POLAND

(a) Order of the Ministry of Public Health respecting the notification of cases of lead, zinc, phosphorus, arsenic, and mercurial poisoning in industrial establishments, factories, and workshops. Dated 20 September 1920. (*Law Gazette of the Polish Republic*, 23 October 1920, No. 98. p. 652.) (*Rozporządzenie Ministra Zdrowia Publicznego w przedmiocie zgłaszania zatruc ołowiem, cynkiem, fosforem, arszenikiem i rtęcią w zakładach przemysłowych, fabrykach i warsztatach z dnia 20 września 1920 r.*) (*L. S.*, 1920, Pol. 2.)

(b) Order of the President of the Republic respecting the prevention and combating of occupational diseases. Dated 22 August 1927. (*Rozporządzenie Prezydenta Rzeczypospolitej z dnia 22 sierpnia 1927 r. o zapobieganiu chorobom zawodowym i ich zwalczaniu.*) (*L. S.*, 1927, Pol. 9.)

The Order of 1920 renders compulsory notification of cases of poisoning by lead, zinc, phosphorus, arsenic, or mercury occurring in industrial establishments, factories or workshops. Notification must be effected within 24 hours to the competent communal authority, together with the name and address of the sick person by every person specified to do so in the Act respecting contagious and other epidemic diseases, and in particular by the medical practitioner consulted by the sick person; the heads of hospitals and nursing institutions; members of the family of, or those responsible for, the sick person; and employers.

Notification shall be followed by an inquiry for the purpose of verifying the case of poisoning and determining its origin. The order of 1927 dealing with notification of occupational diseases is chiefly concerned with prevention. Occupational diseases for the purposes of this Order shall mean all acute or chronic diseases, which arise in consequence of the exercise of a particular trade, the peculiar character of the work involved, or the conditions under which this work is performed. Lists of these diseases shall be promulgated by Orders¹. The following persons shall be responsible for notification of occupational diseases: the doctor in charge of the case, the doctor of the

¹ The Ministerial Order of 17 December 1928 contains a list of these diseases.

sickness fund or where none such is available, doctors attached to factories, hospitals, clinics; the doctor who carries out the autopsy, etc.

Notification of cases of occupational diseases shall be sent in writing to the local public health authority within twenty-four hours of diagnosis and also to the labour inspector, an inquiry into the matter being subsequently instituted.

As regards *compensation* the provisions relative thereto are to be found in the Bill of a general Act on social insurance presented to Parliament in 1932. In accordance with this Bill victims of certain occupational diseases (poisoning by lead, its alloys and compounds, by mercury, its amalgams and compounds, in establishments in which the workers are exposed to the action of these substances; anthrax infection in agricultural undertakings and in establishments in which the workers are brought into contact with sick animals or infected materials), are entitled to the same benefits as in the case of accidents.

PORTUGAL

(a) Act No. 83 of 24 July 1913 on accident compensation and subsequent amendments. (*Lei no. 83 estabelecendo o direito à assistência clínica, medicamentos e indemnização para os operários e empregados vítimas de acidente no trabalho.*) (*Diário do Governo*, 24 July 1913, No. 171.)

(b) Decree No. 5637 of 10 May 1919 relative to compulsory social insurance against industrial accidents in all occupations. (*Decreto no. 5637 organizando o seguro social obrigatório na doença. 10 maio 1919.*) (*Diário do Governo*, 1919, 1 ser., No. 8 suppl.)

(c) Decree No. 21978 of 10 December 1932 stating that pending promulgation of administrative regulations in application of section 3 of the Decree No. 5637, the only diseases to be considered occupational diseases for assimilation to industrial accidents shall be those which are enumerated in the schedule to the 1925 Convention. (*Decreto no. 21978, determina que até a regulamentação do artigo 3 do decreto no. 5637 so sejam consideradas doenças profissionais incluídas na categoria de desastres no trabalho as que se acham compreendidas na convenção internacional de Genebra de 1925, confirmada e ratificada pelo Governo Português pela Carta de 3 de abril de 1929. 10 de dezembro de 1932.*) (*Diário do Governo*, 15 December 1932, I, No. 291, p. 2455.)

Under the Act of 24 July 1913 any external or internal injury and any nervous or psychic derangement resulting from a violent external action occurring in the course of employment is considered as an industrial accident. Further, the following diseases are assimilated to accidents for the purposes of compen-

sation: acute forms of poisoning produced during and as the result of employment, as well as forms of bursitis.

The Decree of 10 May 1919 further supplements the above by the following addition: "all cases of occupational disease duly certified."

Finally, the Decree of 10 December 1932 provides that pending promulgation of administrative regulations in application of the Decree of 10 May 1919 there shall only be considered as occupational diseases those inscribed in the international Convention of 1925, that is to say, poisoning by lead, its alloys or compounds and its sequelae; poisoning by mercury, its amalgams and compounds and its sequelae; and anthrax infection.

RUMANIA

(a) Act dealing with health and protection of workers. Dated 4 July 1930. (*Legea sanitară si de ocrotire, din 4 Julie 1930.*) (Mon. Offic., 1930, No. 154, p. 5338.)

(b) Act codifying social insurance legislation. Dated 7 April 1933. (*Lege pentru unificarea asigurilor sociale din 7 Aprile 1933.*) (Mon. Offic., 1933, No. 83, p. 2300.)

The 1930 Act requires that any medical man who finds an industrial worker suffering from symptoms of poisoning by lead, phosphorus, mercury, arsenic, or any other poisoning or occupational disease should notify the case to the local administrative authorities, at the same time informing the employer concerned. Such notification is merely intended for the purposes of prophylaxis and has no connection with payment of compensation for occupational diseases.

Compensation is dealt with in the 1933 Act, dealing with reorganisation of accident, sickness and invalidity insurance etc. which considers as occupational diseases those diseases due to permanent utilisation of certain toxic substances, assimilating them to accidents, for the purposes of compensation, provided that the degree of permanent working incapacity exceeds two thirds.

The schedule of occupational diseases shall be drawn up by the Management Committee of the Central Insurance Fund. It may be supplemented later by vote of the General Meeting of the Central Fund on the recommendation of the medical committee of the said Fund.

SOUTHERN RHODESIA

(a) An Ordinance to provide for the payment of compensation to native labourers who suffer an injury or death in the course of their employment. Promulgated 4 August 1922. (Ordinance No. 15, 1922.) (*L. S.*, 1922, *S. R.* 1A.)

(b) An Ordinance to compensate for injuries suffered by workmen in the course of their employment, or for death resulting from such injuries. Promulgated 22 September 1922. (Ordinance No. 20, 1922.) (*L. S.*, 1922, *S. R.* 1B.)

(c) An Act to amend the Workmen's Compensation Ordinance, 1922, and to provide for compensation in cases of industrial diseases. No. 17 of 1930. Promulgated 30 May 1930. (*L. S.*, 1930, *S. R.* 2.)

The definition of occupational diseases is provided in the Act of 1930, which considers as such the diseases mentioned in an appendix to the Act and which have caused incapacity or death of a worker engaged in one of the processes indicated in the said schedule. The schedule is as follows:

Description of disease	Description of work
Cyanide rash.	The handling of cyanide or any work involving the use of cyanide.
Lead poisoning or its sequelae.	The handling of lead or its preparations or compounds or any work involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any work involving the use of mercury or its preparations or compounds.

Nothing in this Act will affect the rights of a workman to recover compensation under the Order in respect of a disease other than a scheduled disease if the disease is the result of an accident. If the workman at or immediately before the date of the certificate, or of his death as the case may be, was employed in any work mentioned in the schedule, and the disease contracted is the disease set opposite the description of such work, the disease, unless the certifying medical practitioner certifies that in his opinion it was not due to the nature of the work, shall be deemed to have been due to the nature of that work unless the employer from whom compensation is claimed proves the contrary. Notice shall be given to the employer who last employed the workman during the twelve months preceding the commencement of incapacity, and in the work to the nature of which the incapacity is due.

Compensation shall be recoverable from the employer who last employed the workman during the twelve months referred to, unless that employer shall be able to establish that the

disease was not contracted while in his employment. The workman or his dependants, if so required, shall furnish to the employer from whom compensation is claimed such information as he or they may possess as to the other employers who, during the said twelve months, employed the workman in the work to the nature of which the disease is due. If the employer alleges that the disease was in fact contracted whilst the workman was in the employment of some other employer, he may cause such other employer to be joined as a party to the application, and, if the allegation is proved, compensation is recoverable from that other employer. If the disease is of such a nature as to be contracted by a gradual process, any other employers who, during the said twelve months, employed the workman shall be liable to make to the employer from whom compensation is recoverable such contributions as, in default of agreement, may be determined by the magistrate on application.

SPAIN

Decree of 8 October 1932 containing the consolidated text of legislation respecting industrial accidents. (*Decreto relativo al texto refundido de la legislación de accidentes del trabajo en la industria. 8 de octubre de 1932.*) (L. S., 1932, Sp. 6.)

The Decree of 8 October 1932 describes as an “accident” any physical injury suffered by a wage-earning employee during or in consequence of work which he performs on account of another.

STRAITS SETTLEMENTS

An Ordinance to provide for the payment by certain classes of employers to their workmen of compensation for injury by accident. No. 9 of 1932. Assented to 21 June 1932. (L. S., 1932, S. S. 2.)

The third paragraph of section 3 of the Ordinance of 21 June 1932 assimilates to industrial accidents those diseases inscribed in the first column of the fourth schedule of the Act, on condition that they have been contracted in one of the corresponding processes mentioned in the second column of the said schedule. The schedule is as follows:

Description of diseases	Description of process
Lead poisoning or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.

Description of disease	Description of process
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Poisoning by benzine and its homologues or sequelae.	Handling benzine or any of its homologues, or any process in the manufacture or involving the use thereof.
Chrome ulceration or its sequelae.	Any process involving the use of chromic acid or bichromate of ammonium potassium or sodium or their preparations.

The Ordinance also assimilates to industrial accidents entitling the worker to compensation, anthrax contracted by a worker employed in an occupation involving the loading, unloading, handling or transport of wool, hair, bristles, or animal carcasses or parts of such carcasses or in any work in connection with animals infected with anthrax.

The worker must have been engaged for a continuous period of not less than six months in the occupation in which he has contracted the disease.

Occupational diseases are assimilated to industrial accidents with full rights on the part of the worker, the onus of proof that the accident has arisen out of and in course of employment resting with the employer.

SWEDEN

(a) Act of 17 June 1916, on accident insurance and subsequent amendments. (*Lag om försäkring för olycksfall i arbete. Den 17 juni 1916.*) (*Svensk Författningssamling*, 1916, No. 235.)

(b) Act respecting insurance against occupational diseases. Dated 14 June 1929. (*Lag om försäkring för vissa yrkessjukdomar. Den 14 juni 1929.*) (*L. S.*, 1929, Swe. 1 A.)

(c) Royal Notification to issue special regulations under Act No. 131 of 14 June 1929. (*Kungl. Maj: ts Kungörelse med särskilda föreskrifter i anledning av lagen den 14 juni 1929 om försäkring för vissa yrkessjukdomar. Den 22 nov. 1929.*) (*L. S.*, 1929, Swe. 1 B.)

(d) Act to amend section 1 of Act No. 131 of 14 June 1929, respecting insurance against certain occupational diseases. Dated 12 September 1930. (*Lag angående ändrad lydelse av 1 § a lagen den 14 juni 1929 om försäkring för vissa yrkessjukdomar. Den 12 september 1930.*) (*L. S.*, 1930, Swe. 4 A.)

(e) Royal Notification to amend Notification No. 369 of 22 November 1929 respecting insurance against certain occupational diseases. Dated 7 November 1930. (*Kungl. Maj: ts Kungörelse angående ändring i Kungörelsen den 22 nov. 1929 med särskilda föreskrifter in an ledning av lagen den 14 juni 1929 om försäkring för vissa yrkessjukdomar. Den 7 nov. 1930.*) (*L. S.*, 1930, Swe. 4 B.)

(f) Royal Notification to amend Notification No. 369 of 22 November 1929. Dated 13 March 1931. (*Kungl. Maj: ts Kungörelse angående ändring i Kungörelsen den 22 november 1929 med särskilda föreskrifter*

i an ledning av lagen den 14 juni 1929 om försäkring för vissa yrkessjukdomar. Den 13 mars 1931.) (L. S., 1931, Swe. 2.)

The Act of 14 June 1929 assimilates occupational diseases to industrial accidents when injury caused by such a disease is due to the action of one of the following:

arsenic or any compound thereof;
lead or any alloy or compound thereof;
mercury or any amalgam or compound thereof;
phosphorus or any compound thereof;
radiant heat or light;
X-rays or radium;
anthrax infection.

An amendment to the 1929 Act issued in 1930 supplements the above list by the addition of stone dust, liable to cause respiratory disease including silicosis.

With a view to describing more explicitly the character of the occupational diseases in question, a schedule was published in the Royal Notification of 22 November 1929, completed by the Royal Notifications of 7 November 1930 and 13 March 1931. This schedule is as follows:

Substances, etc., mentioned in section 1 of the Act respecting insurance against certain occupational diseases

Arsenic or any compound thereof.

Lead or any alloy or compound thereof.

Forms of disease

Dermatitis, conjunctivitis, gangrene, nephritis, paralysis, muscular atrophy, hardness of hearing, vertigo.

Lead colic, myalgia, arthralgia, lead paralysis, lead gout, failure of sight and hearing, vertigo, affections of the heart and circulatory system, changes in the composition of the blood, hematomorphyrinuria, nephritis.

Processes

Smelting of arsenical ores (iron, copper, zinc). Work in brass foundries, tanneries and glassworks. Bronzing of brass. Dipping in the galvanising industry.

Employment in lead smelting works and lead factories in casting, drawing, stamping and rolling. Manufacture of articles made of lead, lead alloys, lead accumulators and goloshes. Employment in printing works of all kinds. Employment in enamelling works, china and earthenware factories and file cutting works. Employment in the installation and maintenance of lead pipes and lead linings in the chemical industry. Leadburning, especially in sulphuric acid factories. Painting operations in which lead pigments are used.

Substances, etc. mentioned in section 1 of the Act respecting insurance against certain occupational diseases

Forms of disease

Processes

Mercury or any amalgam or compound thereof.

Stomatitis, enterocolitis, dermatitis, tremors, paralysis, general loss of strength, kidney diseases, hardness of hearing, vertigo.

Manufacture of incandescent lamps and thermos flasks (work with mercury pumps), of mercury thermometers, barometers and similar articles, and of mirrors silvered with mercury and felt hats. Gilding, silvering and tinning. Treatment of seeds and of hides; dressing of skins and furs. Employment in photographic studios.

Phosphorus or any compound thereof.

Sclerosis, necrosis, conjunctivitis, headache, hardness of hearing, vertigo, arthralgia, muscular weakness, tremors, cramps, vomiting, colic, visual disorders.

Manufacture of phosphorus, sesquisulphide of phosphorus and other poisonous compounds of phosphorus. Manufacture of phosphor bronze and similar products.

Stone dust.

Diseases caused by pulmonary changes which can be shown by means of an X-ray examination to have arisen through the influence of stone dust (silicosis).

Dry boring in mines and quarries. Crushing and working up of minerals and rocks in a dry condition. Grinding with natural or artificial stone. Crushing and mixing in a dry condition of materials for glass manufacture. Manufacture of china. Sandblasting.

Increasing dyspnoea or obstinate catarrh of the respiratory passages with pulmonary changes accompanied by an X-ray picture characteristic of silicosis.

Pulmonary tuberculosis accompanied by pulmonary changes and an X-ray picture characteristic of silicosis.

Radiant heat or light.

Injuries to the eyes, dermatitis.

Employment in glass-works. Employment at the furnace and in tapping in iron, metal and enamelling works and in foundries. Welding.

X-rays or radium.

Dermatitis, atrophy of the skin, X-ray epithelioma, anaemia.

Employment in connection with X-ray apparatus and radium.

Anthrax infection.

Anthrax.

Employment in slaughterhouses and tanneries. Employment in the loading and unloading of hides. Tending cattle.

In case of occupational disease, notice shall be given to the employer or his representative of the date of the appearance of the disease. An acknowledgment of this notice shall be given in writing by the employer. Provided that the worker ceases to be employed in dangerous work before the said date, the notice shall be given to the employer with whom the worker was last employed in such work.

Compensation shall not be due in respect of an occupational disease unless the worker has been employed within the year immediately preceding the date of the appearance of the disease in a process where the workers are exposed to an influence of the kind which causes the disease in question, or, in the case of an occupational disease caused by the influence of X-rays or radium, unless he has been so employed within the ten years immediately preceding the said date. The right to compensation for an occupational disease shall lapse in case of failure to give notice to the employer within two years of the date of the appearance of the disease or to make the application for compensation on account of the disease to the State Insurance Institution or to the Insurance Council, or, in cases where an insurance company is liable for payment of compensation to the Institution the Council, or the Company.

Compensation for occupational diseases shall be paid by the insurance institution with which the worker is insured under the Industrial Insurance Act at the date of the appearance of the disease.

Payment in compensation for occupational diseases shall be paid by the insurance institution at the date of the appearance of the disease, provided that if the worker ceases to be employed in dangerous work before the said date the compensation shall be paid by the insurance institution with which the worker was last insured in respect of such employment under the said Act.

If the worker during the period specified has been insured with more than one insurance institution, the expenses of compensation shall be distributed among the insurance institutions in proportion to the period covered by insurance with each.

SWITZERLAND

(a) Federal Act of 13 June 1911, respecting sickness and accident insurance, and subsequent amendments.

(b) Order I on accident insurance of 25 March 1916.

(c) Order I bis on accident insurance of 20 August 1920. (*L. S.*, 1920, Switz. 8.)

(d) Order I ter on accident insurance of 8 December 1922 (*Recueil des lois fédérales*, 1922, No. 38, p. 587.)

(e) Order I quater on accident insurance of 8 November 1927. (*L. S.*, 1927, Switz. 3.)

(f) Order II on accident insurance of 3 December 1927.

Prior to the introduction of the Factory Act of 23 March 1887 workers who were victims of occupational diseases came within the scheme of the common law as regards responsibility for these, that is to say, the onus of proof that the injury suffered was due to the fault of the employer rested on them. The Act of 23 March 1887, introduced the principle of occupational risk as regards industrial diseases. Article 5 of this Act reads as follows:

“The Federal Council shall designate those industries exercise of which may give rise in an exclusive and essential manner to certain serious diseases, in regard to which responsibility shall be assigned as in the case of accidents.”

Nevertheless, at the outset the right to issue regulations relative to all industrial operations and activities liable to cause disease and involve responsibility on the part of the employer, as in the case of accidents, was not much exercised by the Federal Council; in fact only two regulations were issued, one concerning the manufacture of matches with white phosphorus (Decree of 17 October 1882) and the other a Circular dealing with poisoning due to the use of lead weights in Jacquard looms (Circular of 29 November 1884), until substitution of iron weights should be completed.

It was only by an Order of 19 December 1887 that the Federal Council, considering the employer as responsible for safety, decided that those industries “liable to give rise in an exclusive and essential manner” to certain serious diseases should be interpreted as those in which certain toxic substances enumerated in a list are utilised or produced. The list in question contains mention of ten products and also of three bacterial infections: smallpox, anthrax and glanders. The industries

affected were in consequence assimilated to accidents as regards responsibility for certain given diseases.

The Order of 1887 was replaced by another dated 18 January 1901, which brought the number of substances up to thirty-four.

As a result of the adoption of the Act of 13 June 1911 on sickness and accident insurance, the Order of 25 March 1916 introduced the present system of compensation for occupational diseases, and the number of substances, which had been increased to forty-seven in 1916, was further augmented to eighty-two in 1920 (Order of 20 August) and finally completed again by the provisions of the Order of 8 November 1927.

The Federal Act of 13 June 1911, on sickness and accident insurance constitutes a very important departure from precedent in regard to compensation, since the earlier formula is replaced by a statement to the effect that: The Federal Council shall draft a schedule of substances the production or use of which gives rise to serious diseases. This Act assimilates to accidents for the purpose of compensation every disease *exclusively or essentially* due to the action of one of these substances in an establishment coming within the Act.

According to the provisions of the Act the list may only contain: (a) substances produced or utilised in establishments coming within the Act; substances causing serious disease.

As regards the term "serious" it must be stated that it has always been interpreted to mean a disease "capable of becoming serious": it is in particular this interpretation which has been ascribed to it in preparing the list of toxic substances at present in force.

The Order of 20 August 1920 contains the schedule of these substances, which are as follows:

Acetaldehyde,	Benzidine,
Acetylene,	Benzine (petroleum benzine),
Acetylene tetrachloride (tetralin),	Benzol (benzine or benzole),
Acridine,	Benzoylchloride and benzoylbromide,
Quicklime,	Lead, lead compounds and alloys,
Alkalies:	Manganese peroxide,
1. Potash lye,	Tartar emetic,
2. Soda lye,	Bromine,
3. Caustic potash,	Ethyl bromide,
4. Caustic soda,	Methyl bromide,
Alkaloids,	Calcium carbide,
Formic acid (concentrated),	Carbolic acid (phenol),
Ammonia,	Quinine, preparations and derivatives of quinine.
Aniline and its homologues,	
Arsenic and its compounds,	

Chlorine,
Ethyl chloride,
Chloroformic ester,
Chloride of lime (bleaching powder),
Methyl chloride,
Chloroform,
Chlorate of potassium,
Chlorate of sodium,
Sulphur chloride,
Chromium compounds,
Cyanogen and its compounds,
Cyanamide and calcium cyanamide,
Diamines,
Dianisidine,
Dimethyl sulphate,
Dinitrophenol,
Acetic acid (concentrated),
Acetic anhydride,
Fluorine compounds:
1. Silicon fluoride,
2. Hydrofluoric acid,
3. Hydrofluosilicic acid,
4. Carbon tetrafluoride,
Formaldehyde,
Hydroxylamine (phenylhydroxylamine),
Iodine,
Ethyl iodide,
Methyl iodide,
Carbon monoxide,
Nitraniline,
Nitro- and chloronitro-compounds of benzene and its homologues,

Nitroglycerine,
Gaseous oxides of nitrogen,
Nitroso-diethyl-aniline,
Nitroso-dimethyl-aniline,
Nitrosocresol,
Nitrosophenol,
Methyl ether of paratoluenesulphonic acid,
Persulphates,
Phenylhydrazine,
Phosgene (carbonyl chloride),
Phosphorus (yellow modification),
Chloride of phosphorus,
Phosphoretted hydrogen,
Picric acid (trinitrophenol),
Mercury and its compounds,
Nitric acid,
Nitrites,
Hydrochloric acid,
Carbon disulphide,
Sulphide of soda,
Sulphuric acid,
Sulphuric anhydride,
Sulphurous acid,
Sulphuretted hydrogen,
Carbon tetrachloride,
Turpentine oil and turpentine substitutes,
Tar and its gases and oils, pitch,
Toluidine,
Toluene sulphochloride,
Trichlorethylene,
Chloride of tin.

The Order of 8 November 1927, supplements the schedule by the addition of the following substances:

radium and its compounds,
mercury amalgams,
anthrax virus ¹.

The word "essentially" which is happily added to the word "exclusively" annuls the obligations imposed by former acts, and which according to a legal opinion "often threaten to render the privilege of compensation rather precarious, dependent primarily on the proof required by the law of exclusive causation which was frequently either difficult or impossible to adduce ².

¹ By decision adopted in May 1932 the Administrative Council of the Swiss National Accident Insurance Fund has authorised the management of the Fund to grant voluntarily the benefits provided by the Act on Accident Compensation to insured workers suffering from pneumoconiosis in particular from silicosis.

² W. LAUBER. "Fifty Years of Legislation on Occupational Diseases in Switzerland." *International Labour Review*, Vol. XVI, No. 4, Oct. 1927, p. 472.

Substances liable to cause forms of irritation which may greatly inconvenience the worker and render him incapable for work during a certain time (persistent and recurring eczema) and which had hitherto been excluded were added by the Federal Council at the request of the National Fund.

Those in charge of the fund were anxious to go even further, but the provisions of the Act did not permit of this. They prevented, notably, inclusion of those injuries due to work without, however, the intervention of an injurious substance. For this reason the Management Committee decided to grant voluntarily compensation in cases of inflammation of the tendon sheaths, for forms of bursitis, blisters, etc., when such injuries have been caused by particularly violent effort during work, as well as for chapped skin due to cold to which the insured worker has been exposed in the course of his occupation, for abrasions due to continuous friction, and for other similar injuries, provided they have been duly shown to be due to occupation. Further, the National Fund has decided to pay benefits for forms of eczema, chapped skin, abrasions, etc., due to substances not inscribed in the schedule drawn up by the Federal Council, when it has been certified beyond doubt that such lesions are really due to the substances in question and not to lack of cleanliness, to a disease, or to other causes unconnected with the occupation.

Finally, though Article 68 of the Act states that the Federal Council shall draw up a list of substances the production or utilisation of which engender certain "serious diseases" it contains the additional clause: "there shall be assimilated to accidents... any disease exclusively or essentially etc.". Consequently any substance likely to engender serious diseases shall be inscribed in the schedule; but once it has appeared in the schedule any disease which it causes, whether serious or not, is assimilated for the purposes of compensation to an accident.

The right to compensation, benefits accorded and the application and exercise of the provisions of the Act, as well as employers' responsibility, are regulated by the Articles of the Act relating to industrial accidents.

Neither the Act nor the Orders or Regulations issued in administration thereof contain provisions relative to the granting of a medical certificate as regards accidents or occupational

diseases. Complete liberty is left to the National Sickness Fund in relation to this matter. It has drawn up a formula of accident notification which is utilised likewise for occupational diseases. When such a disease is recognised or suspected the physician treating the case receives from the head of the establishment a form upon which he enters replies concerning medical details with a view to informing the Sickness Fund as to the actual facts of the case. In some cases this information suffices, but where further details are required the Sickness Fund sends the physician a further special questionnaire.

The onus of proof in regard to injury from accident or occupational disease rests in principle upon the insured worker. In the case of occupational diseases where the worker has shown proof by medical facts that he is suffering from an occupational disease, he must in principle still prove that he has entered into contact in an establishment subject to insurance with substances liable to cause the disease and has contracted it there. In practice, however, it is the Sickness Fund which carries out this enquiry, since the worker is frequently ignorant of the chemical composition of the products utilised in the establishment and is further unaware of the manner in which he has contracted the disease. If this enquiry leads to the conviction that the disease has not been contracted in such an establishment or causes any doubt to arise in regard thereto, the worker is obliged to furnish proof relative to the conditions which, in virtue of the Act, entitle him to compensation.

The decisions of the Sickness Fund in the case of occupational disease depend even more completely than in that of accidents on the certificate granted by the physician attending the case, or on the advice of experts frequently called in, in regard to this special branch.

In regard to occupational diseases the National Sickness Fund has adopted a very generous attitude. On the one hand in not insisting on absolute proof where a disease due to a substance on the schedule has been recognised as exclusively or essentially due to work in an insured establishment, and on the other hand, in its decision to grant insurance benefits "voluntarily" for those diseases caused by substances not inscribed in the schedule.

The National Fund could not, of course, assume complete responsibility for an occupational disease due only in part to

the substances utilised in an insured establishment and there is therefore in such cases a reduction of the benefits granted (Article 91).

UNION OF SOUTH AFRICA

(a) Act to consolidate, amend and extend throughout the Union the law with respect to compensation for injuries suffered by workmen in the course of their employment or for death resulting from such injuries. No. 25 of 1914. Dated 1 July 1914. (*L. S.*, 1931, *S. A.* 4 B.)

(b) Workmen's Compensation (Industrial Diseases) Act, No. 13 of 1917. Dated 29 May 1917. (*L. S.*, 1931, *S. A.* 4 C.)

(c) Act to amend Workmen's Compensation Act, 1914, No. 29 of 1931. Dated 6 June 1931. (*L. S.*, 1931, *S. A.* 4 A.)

The Act of 29 May 1917 assimilates occupational diseases to industrial accidents and enumerates these in a schedule appended to the Act, which contains likewise a list of the operations in which the diseases enumerated are contracted:

Description of disease	Description of work
Cyanide rash.	The handling of cyanide or any work involving the use of cyanide.
Lead poisoning or its sequelae.	The handling of lead or its preparations or compounds or any work involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any work involving the use of mercury or its preparations or compounds.

The victim of an occupational disease within the meaning of the Act of 29 May 1917, is entitled to compensation on condition that the disease in question has been contracted within the twelve months previous to the date of a certificate certifying incapacity. Nothing in this Act shall affect the rights of a workman to recover compensation in respect of a disease other than a scheduled disease if the contracting of that disease is a personal injury caused by accident within the meaning of the principal Act.

The compensation shall be recoverable from the employer who last employed the workman during the said twelve months in work to the nature of which the disease was due unless he shall be able to establish that the disease was not contracted while the workman was in his employment. The workman or his dependants, if so required, shall furnish to the employer

from whom compensation is claimed requisite information relative to other employers for whom he worked during the said twelve months. If the employer alleges that the disease was contracted whilst the workman was in the employment of some other employer, he may join such other employer as a party to the application, and, if the allegation is proved, that other employer shall be the employer from whom the compensation is to be recoverable. If the disease is of such a nature as to be contracted by a gradual process, any other employer who, during the said twelve months, employed the workman in the work to the nature of which the disease is due, shall be liable to make to the employer from whom compensation is recoverable such contributions as, in default of agreement, may be determined by the magistrate on application.

UNION OF SOCIALIST SOVIET REPUBLICS

(a) Labour Code of the R.S.F.S.R., ed. 1922, Ch. XVII. (*Kodeks Zakonov o Trude R.S.F.S.R.*, izd. 1922, gl. XVII.)

(b) Order No. 95/346 of the People's Labour Commissariat of the Union of Socialist Soviet Republics and the People's Health Commissariat of the R.S.F.S.R. respecting the compulsory notification of occupational poisoning and diseases. Dated 1 March 1924. (*Postanovlenie Narodnago Komissariata Zdravookhranenia R.S.F.S.R. 1.III.24, N 95-346: ob obiazatelnom izvescenii o professionalnykh otravleniakh i zabolevaniakh.*)

(c) Regulations approved by the Central Executive Committee of the U.S.S.R. for provision by means of social insurance for cases of invalidity and loss of the breadwinner. Dated 14 March 1928. (*Postanovlenie C.I.K. i S.N.K. S.S.S.R. 14.III.1928: ob utverzdenii Polozhenia ob obespechenii v poriadke socialnogo strakhovania po slucaju invalidnosti i po slucaju poteri kormilca.*)

(d) Order No. 396 of the U.S.I.C. of the P.L.C. to approve the rules for provision by means of social insurance for cases of invalidity and loss of the breadwinner. Dated 4 July 1928. (*Postanovlenie Sojuznago Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 4.7.1928, N 396: ob utverzdenii Pravil obespechenia v poriadke socialnogo strakhovania po invalidnosti i po slucaju poteri kormilca.*)

(e) Order No. 75 of the U.S.I.C. of the P.L.C. of the U.S.S.R. to approve the new edition of the list of occupational diseases. Dated 4 January 1929. (*Postanovlenie Sojuznago Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 4.1.1929, N 75: ob utverzdenii Spiska professionalnykh zabolevanij v novoj redakcii.*) (L. S., 1929, Russ. 8 A.)

(f) Order No. 352 of the U.S.I.C. of the P.L.C. of the U.S.S.R. dated 19 October 1929, for provision by means of social insurance for cases of invalidity. (*Postanovlenie Sojuznago Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 19.10.1929, N 352: ob izmenii i dopolnenii Pravil obespechenia v poriadke socialnogo strakhovania po invalidnosti i po slucaju poteri kormilca.*)

(g) Order No. 54 of the U.S.I.C. of the P.L.C. of the U.S.S.R. dated 11 February 1930, to complete and amend the regulation for provision by means of social insurance for cases of invalidity and loss of the breadwinner. (*Postanovlenie Sojuznogo Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 11.2.1930, N 54: ob izmenenii Pravil obespechenia po invalidnosti i po slucaju poteri kormilca.*)

(h) Order No. 204 of the U.S.I.C. of the P.L.C. of the U.S.S.R. Dated 23 May 1930. Amending the Regulation for the provision of social insurance for cases of invalidity and loss of the breadwinner. (*Postanovlenie Sojuznogo Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 23.5.1930, N 204: ob izmenii Pravil obespechenia po invalidnosti i po slucaju poteri kormilca.*)

(i) Order No. 40 of the U.S.I.C. of the P.L.C. of the U.S.S.R., dated 20 January 1931, to supplement the schedule of occupational diseases. (*Postanovlenie Sojuznogo Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 20.1.1931, N 40: o doplnenii spiska professionalnykh zabolevanij.*)

(j) Order No. 34 of the U.S.I.C. of the P.L.C. of the U.S.S.R., dated 28 January 1932, respecting regulations for insurance in case of temporary incapacity for work. (*Postanovlenie Sojuznogo Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 28.1.1932, N 33: ob utverzdenii Polozhenia o posobiakh po vremennoj netrudosposobnosti, utverzdennoe Sojuznym Sovetom socialnogo strakhovania pri N.K.T. S.S.S.R., 28.1.1932, N 34. Polozhenie o posobiakh po vremennoj netrudosposobnosti.*)

(k) Order No. 47 of the U.S.I.C. of the P.C.C. of the U.S.S.R., dated 29 February 1932, respecting pensions in case of sickness and old age and the loss of the breadwinner. (*Postanovlenie Sojuznogo Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 29.II.1932, N 47: ob ulucsenii pensionnogo obespechenia po invalidnosti po slucaju poteri kormilca i po starosti.*)

(l) Appendix to Order No. 47 of the U.S.I.C. dated 29 February 1932 (Sections 2 and 17). (*Prilozhenie k postanovleniju Sojuznogo Soveta socialnogo strakhovania. 29.II.1932, N 47 (k. st. st. 2 i 17.)*)

Provisional list of specially unhealthy processes entitling workers to reduction of apprenticeship and increase of pensions. Dated 29 February 1932. (*Vremennyi spisok vradnykh professij, dajuscikh pravo na ponizenie staza i povysenie pensii. 19.II.1932.*)

(m) Order No. 48 of the U.S.I.C. of the P.L.C. of the U.S.S.R., dated 29 February 1932, respecting increase of pensions for invalid workers of the first and second groups. (*Postanovlenie Sojuznogo Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 29.II.1932, N 48: o povysenii minimalnykh razmerov pensij dlja rabocikh-invalidov pervoj i vtoroj grupp.*)

(n) Order No. 60 of the U.S.I.C. of the P.L.C. of the U.S.S.R., dated 29 February 1932, relative to the revision of allowances and pensions to invalid workers of the 4th, 5th and 6th groups. (*Postanovlenie Sojuznogo Soveta socialnogo strakhovania pri N.K.T. S.S.S.R., 29.II.1932, N 60: o poriadke peresmotra pensij, naznacaemykh invalidam 4, 5 i 6 grupp.*)

The definition of occupational diseases is to be found in the Order of 4 January 1929, completed by that of 20 January 1931, which defines as such, diseases occurring with particular frequency, due to certain industrial processes, and involving occupational injury. The following schedule has been drawn up to act as a guide in this connection.

Name of the disease	Noxious occupational condition giving rise to the disease	Examples of occupations in which most or all of the cases of the disease occur
Poisoning.	Occupational poisons.	Occupations in which there is contact with the poisons in question.
Ankylostomiasis.	Underground work.	Mines, coal mines, tunnels.
Epitheliomatous cancer.	Work with pitch, tar, soot, paraffin, anthracene and similar substances.	Chimney-sweeps, charcoal burners, workers in the corresponding chemical industry.
Chronic dermatitis.	Work with irritants and corrosive substances.	Work in chemical factories in connection with chrome lye, acids and other similar substances; men and women bath attendants in mud bath establishments.
Ulceration of the skin and of the mucous membranes of the nose and mouth, and ulceration of the cornea.		
Pneumoconiosis.	Prolonged inhalation of considerable quantities of dust.	Coal miners, ore miners, persons employed in the silicate industry, grinders and sharpeners.
Caisson disease.	Increased air pressure.	Caisson workers, divers.
Nystagmus.	Underground work.	Ore miners, coal miners.
Serious injuries of the tissues (dermatitis, ulcers, cancer, atrophy).	X-rays and radium.	Persons employed in X-ray chambers, employees preparing X-ray tubes, persons in contact with radium.
Cataract. Inflammation of the retina.	Repeated exposure to radiant energy of considerable intensity.	Glass blowers, welders employed at metallurgical calcining furnaces, autogenous welders.
Deafness due to disease of the inner ear.		
Chronic inflammation of the synovial membranes of the knee, elbow and wrist.	Repeated pressure or friction in the vicinity of the joint in question.	Masons and bricklayers, roof-makers, wood-block-floor-layers, plasterers, putters and trammers (mine workers).
Dupuytren's contraction.	Repeated injury of the palmar fascia.	Drivers, locksmiths, persons engaged in post-marking letters and parcels.
Chronic tendo-vaginitis.	Strenuous work with the muscles concerned.	Women engaged in washing, ironing, packing goods in boxes and packets and labelling.

Name of the disease	Noxious occupational condition giving rise to the disease	Examples of occupations in which most or all of the cases of the disease occur
Occupational neuroses of the co-ordinating centres.	Over-strain of the muscle groups concerned.	Telegraphists, stenographers, typists, pianists, violinists, turners, clerks, draughtsmen.
Neuralgia and neuritis of the extremities.	Over-strain of the extremity concerned, or pressure on the main nerve.	Smiths, washerwomen, dockers.
Varicose veins in the legs, with swelling or ulcers.	Prolonged standing or walking.	Compositors, dockers, persons employed at benches, postmen, waiters, dentists, shop assistants.
Chronic deformation of the joints of the extremities (flat foot, baker's sore leg, etc.).	Over-strain of the joints.	
Loss of voice owing to injury to the vocal cords, chronic laryngitis or singer's vocal knot.	Repeated over-strain of the vocal cords.	Singers, teachers.
Progressive myopia.	Prolonged over-strain of the power of vision by near work.	Seamstresses, watchmakers, engravers, proof correctors.
Anthrax.	Contact with animals and animal products, such as hair, leather, wool, bristles, etc.	Workers in slaughterhouses, shepherds, leather workers, workers in brush and felt factories.
Glanders.	Regular contact with horses in caring for these animals.	Coachmen, grooms.
Tetanus.	Work involving direct contact with the ground.	Workers engaged in cultivation, foresters, navvies.
Acute infection in the course of which disease has been contracted as a result of nursing the sick or in so far as there is ground for supposing that the source of infection is related to working conditions.	Systematic contact with sources of infection and infected material.	Medical and veterinary staff, during epidemics and outbreaks of an epizootic disease, engaged in hospitals or centres for infectious diseases, or obliged by their occupation to come into repeated contact with those suffering from infectious disease. Staff in scientific institutes and laboratories handling pathogenic material ¹ .

¹ Syphilis may be considered as an occupational disease, depending on its localisation and in cases where the primary injury is characteristic of the occupation in question (glass blowers: mouth; those attending childbirth: hands; nurses: breast).

This schedule is merely intended as a guide, and attention is directed specially to the unhealthy or dangerous character of the occupation or trade. Where, in an occupation which has given rise to incapacity, it is possible to note the influence of one of the harmful agents indicated in the schedule, the case comes in general under the provisions of the Act. It is not essential that the denomination of the occupation should correspond with one of the designations indicated in the schedule, the enumeration of these being merely of value as an indication or a guide. The double schedule does not imply a rigid correspondence between the nature of the work and the injurious substance. Similarly, there is no mention relative to interruption of work and development of the disease. Such questions are left to be dealt with by the expert entrusted with the medical examination in each case. The diseases given in the schedule are not limited to their simple clinical forms, but comprise also later complications and possible sequelae. Where an occupational disease referred to in the schedule aggravates or accelerates to a marked degree the evolution of a disease which is not of a definitely occupational character, the incapacity thus occasioned must in general be considered as of occupational origin. Finally, the enumeration contained in the schedule is to be regarded as incomplete, and compensation is granted for certain doubtful cases, in which the competent authority on social insurance reserves the right to base his decision on the results of research effected in scientific institutes.

Notification of certain occupational diseases is compulsory (Order of 1 March 1924) with a view to enabling an exact statistical record to be made of the cases observed. Compulsory notification is required for all cases of poisoning due to lead, its compounds and alloys, mercury and its compounds, arsenic and its compounds, phosphorus and its compounds, chlorine and its compounds, hydrochloric and hydrofluoric acid, nitric and nitrous acid, oxides of nitrogen, sulphur dioxide and sulphurous dioxide, sulphuretted hydrogen and carbon disulphide, carbon monoxide (lighting gas, gas from blast furnaces, gas generators and hydrogen gas), petrol, benzene and its homologues, nitrous compounds of the aromatic hydrocarbons, aniline and its compounds, phenol and its compounds, or any other toxic substance. There is also compulsory notification of occupational diseases due to infection (anthrax and glanders), cataract due

to high temperatures and intense lighting, tumours of the bladder due to aniline compounds, and occupational diseases of the skin (eczema, ulcers, burns) contracted in the course of work involving the use of products of distillation of tar, coal, naphtha, or the use of turpentine, chrome, chloride of lime and other chemical compounds. All hospitals and health centres are obliged to notify disease, and all doctors in the service of the State or a public authority, or private physicians, as well as general practitioners, are likewise required to notify such diseases. Notification made on a prescribed form is transmitted both to the subsection for protection of labour of the local labour department and to the branch of the health service in the district in which the sick worker is engaged. The notification should be made within a week after observation of the disease for individual cases, and immediately in the case of mass poisoning.

Occupational diseases involving temporary incapacity are assimilated to ordinary diseases and compensated as such. On the other hand, permanent incapacity constitutes a type of invalidity entitling the victim to compensation on a higher scale than that enjoyed by the victims of ordinary diseases.

Order No. 47 of 1932 permits, in the case of certain harmful or dangerous trades, a reduction of the time which the worker must have completed in his previous occupation in order to qualify for an invalidity pension and an increase of this pension. A first provisional list published in an appendix comprises the following industries:

I. Metallurgical trades	34 occupations
II. Metal industry	47 „
III. Chemical industry	8 „
IV. Varnish and colour industry	6 „
V. Aniline dye industry	4 „
VI. Production of coke and its derivatives.	12 „
VII. Rubber industry	3 „
VIII. Explosives industry	3 „
IX. Glass and porcelain industry	3 „
X. Textile industry	all the dyeing processes
XI. Printing trade	2 occupations
XII. Tobacco	all processes of sorting and breaking up the product
XIII. Railways	3 occupations
XIV. Gas works	4 „
XV. Building trade	caisson work
XVI. Electrical works	4 occupations

UNITED STATES OF AMERICA

Two Acts cover compensation for accidents in the Federal legislation, one concerning civil employees (an Act to provide compensation for employees suffering injuries while in the performance of their duties and for other purposes — Public Act No. 267 — 64th Congress, as amended by Public Act No. 241 — 67th Congress; Public Act No. 196 — 68th Congress; and Public Act No. 432 — 69th Congress¹, and the other long-shoremen and harbour workers (Acts of Sixty-ninth Congress (Second session, 1926-27) (44 Stat. 1424)²).

The second of these Acts is applicable also to the District of Columbia. The term "injury" which is employed in the Act means *accidental injury or death arising out of, and in the course of employment, and such occupational disease or infection as arises naturally out of such employment or as naturally or unavoidably results from such accidental injury.*

Of the forty-four States and four Territories which possess Workmen's Compensation Acts, eleven States (California, Connecticut, Kentucky, Illinois, Massachusetts, Minnesota, New Jersey, New York, North Dakota, Ohio and Wisconsin), and three possessions (Hawaii, Porto Rico and the Philippines) have adopted legal measures concerning compensation for occupational diseases.

These measures are to be found in the following Acts:

California: Workmen's Compensation Insurance and Safety Laws of the State of California. Chapter 176 of the Laws of 1913 and Chapter 586 of the Laws of 1917, as amended by Chapter 471 of the Laws of 1919³.

Connecticut: Workmen's Compensation Act. General Statutes of Connecticut, 1930, section 5223. Originally Chapter 138, Laws of 1913, as amended by Chapters 287 and 288, Laws of 1915; Chapter 142, Laws of 1919; Chapter 306, Laws of 1921; and by Chapter 307, Laws of 1927⁴.

District of Columbia: Workmen's Compensation Law of the District of Columbia. Public Act No. 419, 70th Congress, 45 Stat. 600. Referring to section 2 of the Longshoremen and Harbour Workers Act, Public Act No. 803, 69th Congress, 44 Stat. 1424⁵.

¹ AMERICAN PUBLIC HEALTH ASSOCIATION: Committee on Research and Standards; *Occupational Disease Legislation*, 1931, p. 73.

² *Ibid.*, p. 73.

³ *Ibid.*, p. 66.

⁴ *Ibid.*, p. 67.

⁵ *Ibid.*, p. 69.

Hawaii: Workmen's Compensation Law of the Territory of Hawaii. Revised Laws of Hawaii, 1925, Title XXXII, Chapter 209 ¹.

Illinois: Occupational Disease Law. Illinois Revised Statutes, 1931 (Smith-Hurd), Chapter 48, sections 74 and 87. Originally Laws of 1911, page 330, as amended by Laws of 1921, page 444, and Laws of 1923, page 351 ².

Kentucky: Workmen's Compensation Law. Carroll's Kentucky Statutes, 1930, chapter 137, section 4880. Originally Laws of 1916, chapter 33, as amended by Laws of 1918, chapter 176; Laws of 1922, chapter 50; Laws of 1924, chapter 70 ³.

Massachusetts: Workmen's Compensation Law. General Laws, 1921, chapter 152, as amended by Laws of 1927, chapter 309; Laws of 1930, chapter 205, and by Laws of 1931, chapter 170.

Minnesota: Workmen's Compensation Law. General Statutes of 1923, section 4327. Originally Act of 1921, chapter 82, Part II, section 67 ⁴.

New Jersey: Workmen's Compensation Law. Laws of 1911, chapter 95, as amended by Laws of 1924, chapter 124; Laws of 1926, chapter 31; and by Laws of 1931, chapter 33 ⁵.

New York: Workmen's Compensation Law. Cahill's Consolidated Laws, 1930, chapter 66, section 3. See also Laws of 1931, chapter 344. Originally Laws of 1914, chapter 41, as amended by Laws of 1920, chapter 538; Laws of 1922, chapter 615; Laws of 1928, chapter 754; Laws of 1929, chapter 298; Laws of 1930, chapter 60; Laws of 1931, chapter 314 ⁶.

North Dakota: Workmen's Compensation Law. Acts of 1919, chapter 162, as amended by Laws of 1921, chapter 142; Laws of 1925, chapter 222 ⁷.

Ohio: Workmen's Compensation Law. General Code, 1932, section 1465-68a. Originally Laws of 1921, page 181, as amended by Laws of 1929, page 257; and by Laws of 1931, page 26 ⁸.

Philippine Islands: Workmen's Compensation Law. Public Laws, Vol. 23, Act No. 3428, page 415, effective 10 June 1928, as amended by Act No. 3812, Eighth Philippine Legislature, effective 8 December 1930 ⁹.

Porto Rico: Workmen's Compensation Law of Porto Rico. Acts of 1928, Act No. 85, section 3 ¹⁰.

Wisconsin: Workmen's Compensation Law. Statutes, 1931, section 102.01. Originally Laws of 1931, Chapter 403 (repealing former sections on this subject) ¹¹.

¹ *Ibid.*, p. 70.

² *Ibid.*, p. 75.

³ UNITED STATES DEPARTMENT OF LABOUR: *Bureau of Labour Statistics Bulletin*, No. 423, 1926, p. 226.

⁴ *Ibid.*, p. 289, and Bull. No. 496, p. 115.

⁵ AMERICAN PUBLIC HEALTH ASSOCIATION: *Committee on Research and Standards; Occupational Disease Legislation*, 1931, p. 80.

⁶ UNITED STATES DEPARTMENT OF LABOUR: *Bureau of Labour Statistics Bulletin*, No. 423, p. 377, and No. 496, p. 125. AMERICAN PUBLIC HEALTH ASSOCIATION: *Committee on Research and Standards; Occupational Disease Legislation*, 1931, p. 81.

⁷ *Ibid.*, p. 75.

⁸ UNITED STATES DEPARTMENT OF LABOUR: *Bureau of Labour Statistics Bulletin*, No. 423, p. 400. AMERICAN PUBLIC HEALTH ASSOCIATION: *Committee on Research and Standards; Occupational Disease Legislation*, 1931, p. 86.

⁹ *Ibid.*, p. 72.

¹⁰ *Ibid.*, p. 89.

¹¹ *Ibid.*, p. 74.

California

The term "injury" used in the Act shall include any injury or disease arising out of employment. In case of aggravation of any disease existing prior to such injury, compensation shall be allowed only for such proportion of the disability due to the aggravation of such prior disease as may reasonably be attributed to the injury.

Connecticut

The words "occupational disease" shall mean a disease peculiar to the occupation in which the employee was engaged and due to causes in excess of the ordinary hazards of employment as such. The worker is entitled to compensation in every case in which it is proved that the disease occurred during and on account of employment.

District of Columbia

The term "injury" includes such occupational diseases or infections as arise naturally out of such employment and includes injuries due to the wilful act of a third person directed against an employee because of his employment.

Hawaii

The Law on Accidents affords compensation for "personal injuries by accident arising out of and in course of employment". This definition includes any injury due to the wilful act of a third person directed against an employee because of his employment.

Occupational diseases are assimilated to accidents for the purposes of the Law on Compensation.

Illinois

Occupational diseases are assimilated to accidental injuries and there are considered as such diseases peculiar to and due to the nature of employment in one or more of the following occupations: manufacture, employment or processes of manufacture involving the utilisation or handling of poisonous chemicals, minerals or other substances handled in harmful quantities or under harmful conditions, and more particularly

processes of manufacture in which are involved utilisation or manipulation of sugar of lead, white lead, lead chromate, litharge, minium, arsenate of lead or Paris green, or the manufacture of brass or smelting of lead or zinc.

Workers are likewise entitled to compensation in any of the above processes of manufacture or labour which are unnecessarily productive of noxious or poisonous dusts.

Kentucky

The term "injury" shall include occupational diseases where the diseases are the natural and direct result of a traumatic injury by accident. The sequelae of a pre-existing disease are excluded but the law covers injuries or death due to inhalation in mines of noxious gases or smoke commonly known as "bad air" or to inhalation of any kind of gas.

Massachusetts

Compensation is afforded for "personal injury" arising out of or in course of employment, unless due to serious wilful negligence. Certain "occupational diseases" are covered by this definition as a result of judicial decisions.

Minnesota

Occupational diseases are assimilated to industrial accidents and the following are deemed to be occupational diseases within the meaning of the Act:

Disease	Process
Anthrax.	Handling of wool, hair, bristles, hides or skins.
Lead poisoning, or its sequelae.	Any process involving the use of lead or its preparations or compounds.
Mercury poisoning or its sequelae.	Any process involving the use of mercury or its preparations or compounds.
Phosphorous poisoning or its sequelae.	Any process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of arsenic or its preparations or compounds.
Poisoning by wood alcohol.	Any process involving the use of wood alcohol or any preparations containing wood alcohol.

Disease	Process
Poisoning by nitro and amido derivatives of benzine (dinitro benzol, anilin and others) or its sequelae.	Any process involving the use of a nitro or amido derivative of benzine or its preparations or compounds.
Poisoning by carbon disulphide or its sequelae.	Any process involving the use of carbon disulphide or its preparations or compounds.
Poisoning by nitrous fumes or its sequelae.	Any process in which nitrous fumes are evolved.
Poisoning by nickel carbonyl or its sequelae.	Any process in which nickel carbonyl gas is evolved.
Dope poisoning (poisoning by tetrachlor-methane or any substance used as or in conjunction with a solvent for acetate of cellulose or its sequelae.	Any process involving the use of any substance used as or in conjunction with a solvent for acetate of cellulose.
Poisoning by <i>Gonioma Kamassi</i> (African boxwood) or its sequelae.	Any process in the manufacture of articles from <i>Gonioma Kamassi</i> (African boxwood).
Chromate ulceration or its sequelae.	Any process involving the use of chromic acid or bichromate of ammonium, potassium or sodium or their preparations.
Epitheliomatous cancer or ulceration of the skin or of the corneal surface of the eye, due to tar, pitch, bitumen, mineral oil or paraffin or any compound, product or residue of any of these substances.	Handling or use of tar, pitch, bitumen, mineral oil or paraffin or any compound product or residue of any of these substances.
Glanders.	Care or handling of any equine animal or the carcass of any such animal.
Compressed air illness or its sequelae.	Any process carried on in compressed air.
Ankylostomiasis.	Mining.
Miner's nystagmus.	Mining.
Subcutaneous cellulitis of the hand (beat hand).	Mining.
Subcutaneous cellulitis over the patella (miner's beat knee).	Mining.
Acute bursitis over the elbow (miner's beat elbow).	Mining.
Inflammation of the synovial lining of the wrist joint and tendon sheaths.	Mining.
Cataract in glass workers.	Processes in the manufacture of glass, involving exposure to glare of molten glass.

If an employee at or immediately before the date of disablement was employed in any process mentioned in the second column of the schedule and his disease is the disease in the first column set opposite the description of the process, the disease

presumptively shall be deemed to be due to the nature of that employment. The employer to whom notice of death or disability is to be given or against whom claim is to be made, shall be the employer who last employed the employee during twelve months previous to the date of disablement and such notice and claim shall be deemed reasonable as against prior employers. The employee or his dependants shall on request furnish such information as may enable responsibility to be established.

Neither the employee nor his dependants shall be entitled to compensation unless the disease is due to the nature of his employment and contracted therein within the twelve months previous to the date of disablement.

Nothing in this section of the Act shall affect the rights of the employee to recover compensation in respect of a disease to which this section does not apply.

In the case of partial disability, if it shall be determined that the victim is able to earn wages at another occupation neither unhealthy nor injurious and that such wages do not equal his full wages prior to the date of disablement, the compensation shall be a percentage of the full compensation proportionate to the reduction in his former earning capacity.

Compensation shall be recoverable from the employer who last employed the employee. If, however, the disease was contracted while the employee was in the employment of a prior employer, the employer may appeal for apportionment of such compensation among several employers in proportion to the duration of employment in the service of these.

New Jersey

Occupational diseases are assimilated to injuries by accident and there are considered as such the following diseases: anthrax, lead poisoning, mercury poisoning, arsenic poisoning, phosphorus poisoning, poisoning by benzene, its homologues and derivatives, wood alcohol poisoning, chrome poisoning, caisson disease, mesothorium or radium necrosis.

These diseases are considered as occupational only when exposure stated in connection therewith has occurred during employment, and has caused death or disability which has commenced within five months after the termination of such exposure.

Right to compensation is forfeited in cases of wilful self-exposure to occupational diseases, including failure or omission to observe such rules and regulations as may be promulgated by the Department of Labour and posted in the plant by the employer; failure or omission to furnish exact information relative to the location, duration and nature of previous employment in which exposure to the occupational disease in question was involved.

All claims for compensation should be filed in duplicate with the Secretary of the Compensation Bureau within one year after the date on which the employee ceased to be exposed in the course of employment to such occupational disease or, in the case of an agreement between the employer and the claimant, within one year after failure of the employer to make payment pursuant to the terms of such agreement, or, in case of part of the compensation having been paid by the employer, within one year after the last payment of compensation.

Compensation payable in case of accident is due from the employer in the event of the occurrence of occupational diseases or death from these without regard to the negligence of the employer.

New York

Any worker who suffers incapacity or dies as a result of any of the following occupational diseases is legally entitled to compensation.

Description of disease	Description of process
Anthrax.	Handling of wool, hair, bristles, hides or skins.
Lead poisoning or its sequelae.	Any process involving the use of or direct contact with lead or its preparations or compounds.
Zinc poisoning or its sequelae.	Any process involving the use of or direct contact with zinc or its preparations or compounds or alloys.
Mercury poisoning or its sequelae.	Any process involving the use of or direct contact with mercury or its preparations or compounds.
Phosphorus poisoning or its sequelae.	Any process involving the use of or direct contact with phosphorus or its preparations or compounds.
Arsenic poisoning or its sequelae.	Any process involving the use of or direct contact with arsenic or its preparations or compounds.

Description of disease	Description of process
Poisoning by wood alcohol.	Any process involving the use of wood alcohol or any preparation containing wood alcohol.
Poisoning by benzol or nitro, hydro, hydroxy and amido derivatives of benzene (dinitrobenzol, anilin, and others), or its sequelae.	Any process involving the use of or direct contact with benzol or nitro, hydro, hydroxy or amido derivatives of benzene or its preparations or compounds.
Poisoning by carbon bisulphide or its sequelae, or any sulphide.	Any process involving the use of or direct contact with carbon bisulphide or its preparations or compounds, or any sulphide.
Poisoning by nitrous fumes or its sequelae.	Any process in which nitrous fumes are evolved.
Poisoning by nickel carbonyl or its sequelae.	Any process in which nickel carbonyl is evolved.
Dope poisoning (poisoning by tetrachlor-methane or any substance used as or in conjunction with a solvent for acetate of cellulose or nitrocellulose, or its sequelae.	Any process involving the use of or direct contact with any substance used as or in conjunction with a solvent for acetate of cellulose or nitrocellulose.
Poisoning by formaldehyde and its preparations.	Any process involving the use of or direct contact with formaldehyde and its preparations.
Chrome ulceration or its sequelae or chrome poisoning.	Any process involving the use of or direct contact with chromic acid or bi-chromate of ammonium, potassium or sodium, or their preparations.
Epitheliomatous cancer or ulceration of the skin or of the corneal surface of the eye, due to tar, pitch, bitumen, mineral oil, or paraffin, or any compound, product or residue of any of these substances.	Handling or use of tar, pitch, bitumen, mineral oil, or paraffin or any compound product or residue of any of these substances.
Glanders.	Care or handling of any equine animal or the carcass of any such animal.
Compressed air illness or its sequelae.	Any process carried on in compressed air.
Miners' diseases, including only cellulitis, bursitis, ankylostomiasis, teno-synovitis and nystagmus.	Any process involving mining.
Cataract in glassworkers.	Processes in the manufacture of glass involving exposure to the glare of molten glass.
Radium poisoning or disability due to radio-active properties of substances or to röntgen rays (X-rays).	Any process involving the use of or direct contact with radium or radio-active substance or the use of or direct exposure to röntgen rays (X-rays).
Methyl chloride poisoning.	Any process involving the use of or direct contact with methyl chloride or its preparations or compounds.

Description of disease	Description of process
Carbon monoxide poisoning.	Any process involving direct exposure to carbon monoxide in buildings, sheds or enclosed places.
Poisoning by sulphuric, hydrochloric or hydrofluoric acid.	Any process involving the use of or direct contact with sulphuric, hydrochloric or hydrofluoric acids or their fumes.
Respiratory, gastro-intestinal or physiological nerve and eye disorders due to contact with petroleum products and their fumes.	Any process involving the use of or direct contact with petroleum or petroleum products and their fumes.
Disability arising from blisters or abrasions.	Any process involving continuous friction, rubbing or vibration causing blisters or abrasions.
Disability arising from bursitis or synovitis.	Any process involving continuous rubbing, pressure or vibration of the parts affected.
Dermatitis (venenata).	Any process involving the use of or direct contact with acids, alkalis or oils capable of causing dermatitis (venenata).

If the employee at, or immediately before, the date of disablement was employed in any process mentioned in the second column of the schedule of diseases and his disease is the disease in the first column of such schedule set opposite the description of the process, the disease presumptively shall be deemed to have been due to the nature of that employment, and the worker, or in case of death his dependants, shall be entitled to compensation.

The occupational disease must be notified to the employer who last employed the employee in the course of the previous twelve months, in an employment to the nature of which the disease was due, and during the course of which the disease was contracted, and such notice and claim shall be deemed reasonable as against prior employers.

The disease must have been contracted during the twelve months preceding the date of incapacity.

Nothing in this section of the Act shall effect the rights of the employees to recover compensation in respect of a disease to which this section does not apply.

Assessment of disablement is entrusted to one or several examining physicians appointed by the Commission whose duty it is to examine any claimant for compensation, and to draft reports required by the Commissioner.

The date of disablement is that fixed by the Industrial Board on hearing the claim.

When it is determined that an employee claiming compensation is able to earn wages at another occupation neither unhealthful nor injurious, and such wages do not equal his full wages prior to the date of disablement, the compensation payable shall be a percentage of full compensation proportionate to the reduction in earning capacity.

Total compensation shall be recoverable from the employer who last employed the employee in employment to the nature of which the disease was due and in which it was contracted. If, however, the disease was contracted in course of employment by a prior employer, the employer made liable for the total compensation may appeal to the Board for an apportionment of such compensation among the several employers who, since the contraction of such disease, shall have employed the employee on work to the nature of which the disease was due. Such apportionment shall be proportionate to the time the employee was employed in the service of such employers, and shall be determined only after a hearing of the employers concerned.

The employee and his dependants, if so requested, shall furnish the last employer or the Industrial Board with all requisite information relative to establishing the responsibility of the employers who have employed him in the course of the preceding twelve months. If such information is not furnished or is not sufficient to enable the last employer to take proceedings against a prior employer, unless it be established that the disease actually was contracted while the employee was in his employment, such last employer shall not be liable to pay compensation. In particular cases such last employer shall be liable only for such part of the total compensation as under the particular circumstances the Board may deem just, but a false statement in the information furnished shall not impair the workman's rights unless the last employer is prejudiced thereby.

North Dakota

“Injury” as used in the Law on Accidents means only an injury arising in the course of employment. It includes also an injury caused by the wilful act of a third person directed against an employee because of his employment. The term “injury”

includes, in addition to any injury by accident, any disease proximately caused by the employment.

Ohio

Occupational diseases are assimilated to industrial accidents. There are considered as such those diseases inscribed in the following schedule, when they affect a worker in the course of employment in which he has been constantly engaged, during the twelve months preceding the date of his disability.

Description of disease or injury	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Glanders.	Care of any equine animal suffering from glanders; handling carcass of such animal.
Lead poisoning.	Any industrial process involving the use of lead or its preparations or compounds.
Mercury poisoning.	Any industrial process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning.	Any industrial process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning.	Any industrial process involving the use of arsenic or its preparations or compounds.
Poisoning by benzol or by nitro and amido derivatives of benzol (dinitro-benzol, anilin and others).	Any industrial process involving the use of benzol or a nitro or amido derivative of benzol or its preparations or compounds.
Poisoning by gasoline, benzine, naphtha, or other volatile petroleum products.	Any industrial process involving the use of gasoline, benzine, naphtha, or other volatile petroleum products.
Poisoning by carbon bisulphide.	Any industrial process involving the use of carbon bisulphide or its preparations or compounds.
Poisoning by wood alcohol.	Any industrial process involving the use of wood alcohol or its preparations.
Infection or inflammation of the skin on contact surfaces due to oils, cutting compounds or lubricants, dust, liquids, fumes, gases or vapours.	Any industrial process involving the handling or use of oils, cutting compounds or lubricants, or involving contact with dust, liquids, fumes, gases or vapours.
Epitheliomatous cancer or ulceration of the skin or of the corneal surface of the eye due to carbon, pitch, tar or tarry compounds.	Handling or industrial use of carbon, pitch or tarry compounds.

Description of disease or injury	Description of process
Compressed air illness.	Any industrial process carried on in compressed air.
Carbon dioxide poisoning.	Any process involving the evolution or resulting in the escape of carbon dioxide.
Brass or zinc poisoning.	Any process involving the manufacture, founding or refining of brass or the melting or smelting of zinc.
Manganese dioxide poisoning.	Any process involving the grinding or milling of manganese dioxide or the escape of manganese dioxide dust.
Radium poisoning.	Any industrial process involving the use of radium and other radioactive substances in luminous paint.
Tenosynovitis and prepatellar bursitis.	Primary tenosynovitis characterised by a passive effusion or crepitus into the tendon sheath of the flexor or extensor muscles of the hand due to frequently repetitive motions or vibration, or prepatellar bursitis due to continued pressure.
Chrome ulceration of the skin or nasal passages.	Any industrial process involving the use of or direct contact with chromic acid or bichromates of ammonium, potassium or sodium or their preparations.
Potassium cyanide poisoning.	Any industrial process involving the use of or direct contact with potassium cyanide.
Sulphur dioxide poisoning.	Any industrial process in which sulphur dioxide gas is evolved by the expansion of liquid sulphur dioxide.

Right to compensation for occupational diseases by the victim or his dependants is conditional on the claimant having been resident in the State of Ohio for a period of ninety days next preceding the filing of the claim, or having been employed during that period by an employer required by the workmen's compensation law of Ohio to contribute to the occupational disease fund of Ohio for the benefit of such employee, or to compensate such employee directly under the provisions of the General Code.

Philippine Islands

Occupational diseases are assimilated to industrial accidents, and there are considered as such all diseases directly caused by employment or resulting from the nature of employment.

Porto Rico

Occupational diseases are enumerated in the following table:

Name of disease	Description of process
Anthrax.	Handling of wool, hair, bristles, hides and skins.
Glanders.	Care of any equine animal suffering from glanders; handling carcass of such animal.
Lead poisoning.	Any industrial process involving the use of lead or its preparations or compounds.
Mercury poisoning.	Any industrial process involving the use of mercury or its preparations or compounds.
Phosphorus poisoning.	Any industrial process involving the use of phosphorus or its preparations or compounds.
Arsenic poisoning.	Any industrial process involving the use of arsenic or its preparations or compounds.
Poisoning by benzol or by nitro and amido derivatives of benzol (dinitro-benzol, anilin and others).	Any industrial process involving the use of benzol or a nitro or amido derivative of benzol or its preparations or compounds.
Poisoning by gasoline, benzine, naphtha, or other volatile petroleum product.	Any industrial process involving the use of gasoline, benzine, naphtha or other volatile petroleum product.
Poisoning by carbon disulphide.	Any industrial process involving the use of carbon disulphide or its preparations or compounds.
Poisoning by wood alcohol.	Any industrial process involving the use of wood alcohol or its preparation.
Infection or inflammation of the skin on contact with compound cutting oils or lubricants, dust, liquids, fumes, gases or vapours.	Any industrial process involving the handling or use of compound cutting oils or lubricants, or involving contact with liquids, fumes, gases or vapours.
Ulceration of the skin or of the corneal surface of the eye due to carbon, pitch, tar, or tarry compounds.	Handling or industrial use of carbon, pitch, or tarry compounds.
Compressed air illness.	Any industrial process carried on in compressed air.
Carbon dioxide poisoning.	Any process involving the evolution, or resulting in the escape, of carbon dioxide.
Brass or zinc poisoning.	Any process involving the manufacture, founding, or refining of brass or the melting or smelting of zinc.

For the purposes of the Act the disease must have been contracted by a wage earner or employee during employment in the occupation set opposite in the second column, in course of the twelve months preceding disability due to such disease and resulting from the occupation described in the schedule.

If the disease is of temporary character the employee is entitled to compensation equal to one-half of the wages earned by him when he fell ill for such time as he may be under medical treatment, but such payments shall not extend over a period exceeding 102 weeks, and in no case shall he receive more than \$15 or less than \$3 per week. Compensation shall be allowed for the first seven days following the accident.

If by reason of the disease contracted the worker should be partially and permanently disabled for work, he shall receive such additional compensation as the Commission may determine according to the seriousness of the disability and, as far as possible, according to the accident schedule provided in the Act. In the case of total disablement due to occupational disease, the worker is entitled to compensation amounting to a sum not less than \$1,000 and not exceeding \$3,000.

Medical treatment provided includes medical attendance and medicines prescribed, including hospital service where necessary.

Wisconsin

The term "injury" is defined to include mental and physical harm and to include diseases growing out of and incidental to employment.

NOTE: In Pennsylvania a Bill (H 1607) to amend the Workmen's Compensation Act proposes that compensation be payable for the following occupational diseases: miners' diseases, including only anthracosis, asthma and bursitis; lead poisoning; zinc poisoning; mercury poisoning; phosphorus poisoning; arsenic poisoning; poisoning by carbon disulphide; poisoning by nitrous fumes; poisoning by nickel carbonyl; poisoning by formaldehyde; chrome ulceration; glanders; compressed air illness; radium or Röntgen burns; methyl chloride poisoning; poisoning by sulphuric, hydrochloric or hydrofluoric acid, and respiratory, gastro-intestinal or physiologic nerve and eye disorders. (*J.A.M.A.*, 2 May 1931, p. 1517.)

VENEZUELA

(a) Labour Act. Dated 23 July 1928. (*Ley del trabajo. 23 de julio de 1928.*) (L. S., 1928, Ven. 2.)

(b) Decree issuing regulations under the provisions of the Labour Act, respecting occupational risks. Dated 13 August 1928. (*Decreto: Reglamento de las disposiciones de la Ley del trabajo sobre riesgos profesionales. 13 de Agosto de 1928.*) (L. S., 1928, Ven. 3.)

The Act of 1928 (Chapter IV, Occupational Risks) requires that owners of undertakings — not expressly excepted by a section of the Act — shall pay their wage-earning and salaried employees and apprentices in the said undertakings compensation for industrial accidents and diseases arising directly out of or in the course of employment, whether or not there is any serious fault or neglect on the part of the undertaking or on that of the wage-earning or salaried employees or apprentices. In virtue of the Decree of 1928 there shall be considered as occupational, those diseases enumerated in the following schedule, provided that they were contracted by a wage-earning or salaried employee or apprentice, who at the time of contracting the disease or in the course of the six months previous thereto, was employed in the industries specified in the case of each disease.

1. Anthrax contracted in industries using wool, hair, bristles, hides and skins.
2. Poisoning caused by (a) lead; (b) mercury; (c) phosphorus; (d) arsenic; (e) wood alcohol; (f) the nitro and amido compounds of benzene, such as dinitrobenzol, anilin, etc.; (g) nitrous fumes; (h) tetrachlorethane or any other substance employed instead of or jointly with a solvent of acetate of cellulose; further, the sequelae of the above poisoning when contracted in industries which produce or use the said substances or derivatives thereof.
3. Chrome ulcers and the sequelae thereof, contracted in industries which produce or use chromic acid or bichromate of ammonium, potassium or sodium or preparations or derivatives thereof.
4. Dermatitis of various kinds caused by working on wood such as hardwood (jabillo), etc.
5. Epitheliomatous cancer and ulceration of the skin or of the cornea, contracted in industries which produce, extract or use tar, pitch, asphalt, mineral oil, petroleum, paraffin or any other compound, product or residue of any of the said substances.
6. Glanders, contracted in industries involving the care or use of equine animals or of the carcasses or remains of such animals.
7. Glassworkers' cataract, contracted in the manufacture of glass or in any employment necessitating exposure to the glare of molten glass.
8. Diseases due to plus-pressure, contracted in industries involving the use of compressed air.
9. The following diseases contracted in mining: (a) miners' nystagmus; (b) subcutaneous cellulitis of the hand; (c) subcutaneous cellulitis over the patella; (d) acute bursitis over the elbow; and (e) inflammation of the synovial membrane of the wrist.

YUGOSLAVIA

(a) Act respecting workers' insurance. Dated 14 May 1922. (*Zakon o osiguranju radnika. 14 maja 1922 god.*) (L. S., 1922, SCS. 2.)

(b) Ministerial Decree No. 4445, assimilating to industrial accidents diseases due to anthrax infection. Dated 22 April 1929. (*Resenje no. 4,445 Ministra Socijalne Politike i Narodnog Zdravlja: oboljenje od zaraze od koznog metilja vazikao nesrecni slucaj, 22 aprila 1929 god.*) (*Sluzbene Novine*, of 7 maja 1929 god. Broj 105.)

The Act of 1922 (section 84, paragraph 4), provides for the assimilation to accidents of poisoning by lead, mercury, phosphorus, in cases in which the said forms of poisoning are attributable to the handling of these substances in the course of industrial employment. The following are likewise deemed to be accidents within the meaning of the Act: cholera, plague, yellow fever and beri-beri, when contracted by seamen during marine service. The decision No. 4445 of 1929 assimilates to industrial accidents all diseases resulting from anthrax infection when due to the manipulation of animal products liable to carry the anthrax virus. Finally, the Minister for Social Affairs, in conjunction with other ministers affected, has power to extend compensation to cases of occupational poisoning due to other substances.

SUMMARY OF NATIONAL LEGISLATION ON COMPENSATION FOR OCCUPATIONAL DISEASES

Country	National legislation relating to occupational diseases providing :			Diseases in the international schedules inscribed in national legislation -										Observations	
	1925 Convention										New Draft International Schedule				
	Anthrax infection	Lead poisoning	Mercury poisoning	Phosphorus poisoning	Arsenic poisoning	Poisoning by benzene, its homologues and nitro- and amido-derivatives	Poisoning by tetraethyllead	Diseases due to radium and other radio-active substances	Diseases due to X-Rays	Epitheliomatous cancer of the skin (psoriasis, tar, soot etc.)					
Argentina	X	X	X	—	—	3	3	—	—	—	—	—	—	—	
Australia															
Commonwealth.	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
New South Wales	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
Broken Hill	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
Victoria.	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
Queensland	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
South Australia	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
Western Australia	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
Tasmania	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
Northern Territory.	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
Austria	X	X	X	X	X	X	X	X	X	X	X	X	X	Mention of the diseases is sometimes followed by designation of the processes	
Belgium.	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
Bolivia	X	X	X	X	X	X	X	X	X	X	X	X	X	—	
Brazil.	X	X	X	X	X	X	X	X	X	X	X	X	X	—	

[illegible]

SUMMARY OF NATIONAL LEGISLATION ON COMPENSATION FOR OCCUPATIONAL DISEASES

[illegible]

OFFICE OF THE
ATTORNEY GENERAL

STATE OF NEW YORK

IN SENATE

JANUARY 10, 1907

REPORT

OF THE

COMMISSIONER OF

THE LAND OFFICE

FOR THE YEAR

1906

ALBANY:

1907

PRINTED BY

THE STATE

OF NEW YORK

AT ALBANY

1907

OFFICE OF THE

ATTORNEY GENERAL

THIRD PART

SILICOSIS

The gravity of the situation created both from the point of view of the individual, and that of society by the occurrence of respiratory diseases due to dust could not remain indefinitely a matter of indifference to the responsible authorities. Moreover, experts in industrial medicine had for long been insisting on the importance of the risk incurred by workers in dusty trades.

Those responsible, concerned at once with the effect of this risk on the health of the workers, on the one hand, and on the industrial economy on the other, have sought to frame legislation with a view to restricting the occurrence of disease due to dust, in the first place, and secondly to providing compensation for such cases as occur.

It is true, indeed, that the carrying into effect of preventive measures, more especially those concerned with compensation, has not been achieved without encountering great difficulties. These have, however, been subsequently attenuated, thanks to the results of research undertaken and experience acquired by experts on the subject.

It is since the sixteenth century that attempts have been made to describe in a fairly precise fashion the action of dust on the respiratory passages of miners, quarry workers and metal workers. Diseases characterised by serious dyspnoea, asthma and coughing, most frequently leading to a fatal issue, were already known to Amatus Lusitanus, Paracelsus, Stockhausen (1656) under the name of "phthisis" and "miner's phthisis". In 1649 and in 1683 Istrand Van Diemberbroeck, while conducting *post-mortem* examination of a diamond cutter and three stone cutters, noted the hardness of the pulmonary tissue as a result of the presence of a great deal of dust.

The clinical observations and anatomical research engaged in by the doctors of the eighteenth century cleared up certain

points until then obscure, with the result that at the outset of the nineteenth century fairly accurate knowledge was available both as regards the action of dust in general and as regards certain dusts in particular, as well as on the subject of pulmonary (phthisis) and circulatory complications and, finally, in regard to the presence in the lungs of dusts met with on post-mortem examination.

As these observations dealt for the most part with miners, the medical men in question were led to enquire into the cause of the black pigmentation caused by these dusts. At this time there appeared the works of Andral, Grisolle, Trousseau, Leblanc, Virchow and others, furnishing a series of contributions, the great importance of which has been subsequently realised.

Since 1800 research and experiment have been greatly increased and have justified the affirmation that the terms current until this time — “miner’s phthisis”, “byssinosis”, etc.— designate a different pathological picture, more especially when the dust contains metallic or siliceous particles (Layet, 1874). Beltz (1862) studied the nature of St. Roch’s disease which affected, under the age of forty, sand stone cutters or stone cutters in general, and later there appeared the work of Minel (1869) on chalicosis.

Previous to this, Brockmann (1844) had given a very clear description of anthracosis and “accidental” silicosis and had drawn attention to the presence in the lungs of “pigment” consisting of particles of dust the maximum size of which was 2.5 to 3 μ . In 1867 Seltmann noted that whilst slight inhalation of coal does not give rise to any specific pathological process nor especially to an acute or chronic inflammatory process, on the other hand inhalation of siliceous dust causes frequently, and at an early stage deep-seated lesions of the respiratory organs. It is, according to this author, the impurity contained in the coal dust and especially dust of siliceous nature which is predominant in setting up the pathological condition.

Even experimental research carried out on animals, for periods extending at times to two years, already indicate at this date that “black fibrosis” is only produced by inhalation of a substance capable of setting up in the lung a chronic inflammatory condition and that inhaled siliceous dusts remain fixed in the pulmonary tissue causing there the formation of nodules.

Other experiments justified the affirmation that whilst inhalation of certain dusts only causes deep-seated respiratory lesions after several months, inhalation of sandstone may even after fifteen days produce grey isolated nodules which in confluence constitute extensive fibrosis. The experts in question were, however, well aware of the limited value of their experiments, being convinced that even with long-continued inhalation they could not succeed in obtaining the coniotic lesions similar to those found in man.

At this date there were published the results of the research by von Ins, Ruppert, Arnold, etc., on dust cells and their origin (white corpuscles rather than epithelial cells of the bronchi or alveoli).

In 1882 the tubercular bacillus was discovered and in the same year quantitative dust research was effected in workshops by Hess; and the first micro-photographs of dust (Reichel, 1883) were made, followed ten years later by the research of Migerka and Jehle, and in 1894 by those of Ahrens on quantitative analysis, later of Wegmann, who insisted on the importance of the size of the dust particles in the production of pulmonary lesions.

Up till then experts in the matter who had succeeded in tracing the course of the dust into the alveoli, and in discovering that they were carried by the phagocytes into the internal structure of the lung were of the opinion that the explanation of the pathogenesis of the lesions met with was to be found principally in the physical properties (more or less rounded or pointed angles) of the dust (mechanical action), though here and there a few voices were raised in favour of attributing it rather to chemical action. Experts had insisted on the particularly dangerous nature of quartz dust and had shown that silica became fixed in the lungs whilst other dusts, and in particular those of a calcareous nature, were dissolved and remained apparently without harmful effect.

Though the technique followed is open to fairly severe criticism, statistical returns confirm the excessive mortality due to respiratory diseases amongst workers in dusty trades. Doctors were not yet, however, in a position to distinguish pneumoconiosis in a patient from other diseases. It was only subsequent to the discovery of X-rays (1895) that knowledge was extended in regard to this matter. In various countries

official enquiries were instituted and were pursued with a view to more accurate knowledge of the risk from diseases due to dust: South Africa (1902), New South Wales (1902), Netherlands (1903), Western Australia (1905), Great Britain (1906), Victoria (1907), Queensland (1911), Ontario (1915), etc. In 1916 there appeared the first study in the German language, that of Staub-Oettiker, based almost exclusively on radiographic findings and containing a generally accepted statement: "Whilst data provided by percussion and sounding of the patient are indefinite or inadequate, X-rays provide a characteristic and decisive element in diagnosis."

After a period during which bacteriology predominated unduly at the expense of the other branches of medical science, equilibrium was later established in clinical, hygienic and experimental research. And thus, thanks especially to contributions from experts in industrial hygiene, progress was made in determining more accurately the health risk connected with various types of dust.

Such is in brief and in outline only the account of the successive stages of knowledge relative to respiratory injuries due to dust which henceforth are known under the name proposed by Zenker of "pneumonokonioses", currently shortened to "pneumoconioses". By this term Zenker designated pulmonary fibrosis caused by dust in general. Yet this disease, already well known to workers and doctors, was indicated, in accordance with the occupational category in which it occurred, as: grinder's rot, potter's rot, knapper's rot, black spit, stonemason's phthisis, miner's phthisis. It was at times, with reference to the nature of the dust, designated by the terms: anthracosis (coal), siderosis (iron), chalicosis (stone, sandstone), byssinosis (cotton), and it was not until the beginning of this century that the word "silicosis" was met with as indicating respiratory injury due to silica.

However summary an account of the silicosis problem may be, it must contain reference to all the opinions expressed on the subject, yet, in the impossibility of treating these in detail, the account given will be of necessity but a brief outline of these.

It is since about the year 1900 that the study of silicosis (this term first became current in South Africa and Australia) entered upon a new phase in its development, commissions of enquiry instituted in many countries having succeeded in

assembling all data current on the subject and thanks to radiography and progress in various branches of medicine having been able to trace the clinical and pathological picture of silicosis. In Great Britain Legge (1900) published the results of an enquiry on "ganister" disease, a refractory stone containing 99 per cent. of free silica and, according to Birmingham, causing a very high mortality rate from respiratory disease. Six years later the harmfulness of silica was again emphasised, amongst others by Hall and Haldane, before the Departmental Committee for Compensation of Occupational Diseases (1907), where the term "silicosis" was regarded as the equivalent of "stonemason's phthisis" (*Minutes of Evidence* p. 95). According to the Committee (*Report*, p. 19), the workers exposed in the course of their daily occupation to the inhalation of siliceous or metallic dust suffer from fibroid phthisis, a disease which is typical of their occupation and which can be sufficiently distinguished from other diseases.

Attempts were made at this time to define more clearly the specific action of silica on the live cell and to proceed with the study of the disease in accordance with an organic plan (Great Britain, South Africa, etc.). Ground having been broken, especially as regards nomenclature, by Collis (1913), there followed the Report of the Royal Commission on Metalliferous Mines and Quarries in Great Britain, 1914, as well as the classic Report of the Miners' Phthisis Committee in South Africa in 1916, in which the picture of silicosis from the etiological, pathological, symptomological and radiological standpoint is already found clearly traced.

It is true that during two decades efforts were principally confined to silicosis, but while studying it scientists succeeded also in defining the action of many other dusts, several of which were proved to be, contrary to former opinion, harmful to the respiratory apparatus of man.

The first thirty years of the twentieth century therefore marks considerable progress¹ in the knowledge of forms of

¹ For the numerous bibliographical references on pneumoconioses and silicosis in particular, see *Pneumoconioses, A List of References*, published by the INTERNATIONAL LABOUR OFFICE, Studies and Documents, Series F (Industrial Hygiene) No. 15, 76 pp., as well as the periodical publication, *Bibliography of Industrial Hygiene*, also published by the Office.

Amongst the numerous publications reviewed in drafting the present chapter may be mentioned amongst others: for Belgium: Courtois,

pneumoconioses, and it is on the basis of this progress and the data so far provided by it, and co-ordinated for the most part at the International Conference in Johannesburg (1930)¹ that this report has been drafted.

* * *

The International Labour Office has always followed with the closest attention research engaged in by scientists as well as the findings reported by practising physicians relative to pneumoconioses in general and silicosis in particular. The reports on debates during national and international meetings on industrial medicine, special publications and, more particularly, the results provided in certain countries by compensation legislation, have furnished the Office with sufficiently extensive information to enable a programme of activity to be drafted.

For their part, workers' organisations comprising miners, pottery workers and other interested groups, and more particularly the International Federation of Stone Workers have since 1921 unceasingly advanced their demands for compensation of silicosis. The first official step taken by the International Labour Office dates back to January 1926. On a demand made by the International Secretariat of Stone Workers during the preceding year there was submitted to a certain number of experts a questionnaire relative to the eventual inscription of silicosis amongst those diseases entitling victims to compensation. The Correspondence Committee on Industrial Hygiene, however, at its meetings in 1926 and 1928, when deliberating as to the diseases which should be inserted in the schedule of the 1925 Convention, was of the opinion that the time was not yet ripe for the inclusion of silicosis.

Nevertheless, this problem continued to occupy the attention of the Industrial Hygiene Service of the Office, which

Glibert, Denet-Kravitz; for Canada: Cunningham, etc.; for France: Arnould, Policard, Rist, etc.; for Germany: Böhme, Ickert, Lochtkemper, Reichmann, Saupe, Teleky, etc.; for Great Britain: Bridge, Collis, Crocket, Cummins, Middleton, Kettle, etc.; for South Africa: Irvine, Mavrogordato, Orenstein, Simson, Sutherland Strachan, Steuart, Watt, etc.; for the United States: Gardner, Jarvis, Pancoast, Pendergrass, Russell.

¹ Appreciations of the deliberations of the Conference:

COLLIS: *A Landmark in the History of the Disease at which a Summary of Present Knowledge becomes Useful.*

TELEKY: *Diese Leitsätze über Aetiologie und Pathologie der Silikose . . . , von den berufensten Fachmännern zusammengestellt und gutgeheissen, geben ein klares Bild des heutigen Standes unserer Kenntniss.*

proposed that the International Committee on Industrial Medicine "should place the question on the agenda of its 1929 meeting (Lyons)". In 1930 the International Conference on Silicosis took place in Johannesburg¹. Previous, however, to the opening of this Conference, the British Government representative proposed to the Governing Body of the Office (Forty-seventh Session) the inscription of compensation for silicosis on the agenda of the International Labour Conference (1931 Session).

Priority accorded to other problems involved adjournment and the Governing Body did not again resume discussion of the problem until its Sixtieth Session (October 1932). On this occasion there was contemplated the inscription on the agenda of the 1934 Conference of extension of the schedule of occupational diseases with the inclusion of silicosis. In this manner the Governing Body gave effect to the resolutions adopted at the International Labour Conference, on the proposals of Messrs. Müller and Schürch (1931) and Schürch (1932), that a supplementary list of occupational diseases including silicosis should be inscribed on the agenda.

The provisional decision taken by the Governing Body in October 1932 was confirmed at the 1933 Session (January)².

DEFINITION

Silicosis sensu stricto, denotes a pathological condition of the lungs due to the inhalation of silica (more precisely bioxide of silica, Si. O₂) chemically uncombined (free silica such as is found in quartz, flint, sandstone, etc.)³.

In practice, it is not always a case of the inhalation of almost pure silica such as may, however, occur in certain occupations (gold mines, work with "ganister", sandstone, etc.). More frequently a natural mixture (granite dust, for example) or an artificial mixture (cleaning powders, for instance) is involved, with a highly variable silica content. The fact that in

¹ See p. 107.

² See p. viii.

³ "Fibrosis of the lungs due to silica dust" (English legislation). "Pulmonary affection caused by absorbing siliceous, calcareous or argillaceous dusts" (French legislation). "Pulmonary sclerosis of slow evolution caused by deposits of siliceous dusts" (BAUER, ENGEL, KÆLSCH and KROHN: *Commentary on the Second German Order on Compensation*, p. 228).

practice only mixed dusts with a complex chemical composition, often so far insufficiently known, are inhaled and that successively during his working experience an individual may be exposed to various types of dust — not omitting the consideration that even in normal existence in the town or country inhalation of these likewise occurs — requires that a general term such as “pneumoconiosis” should be replaced by a more precise term indicating, as far as possible, the cause of the morbid condition. It will be seen later which types of dust must be taken into consideration with a view to determining more accurately the picture of silicosis.

However, it must be borne in mind that the term “silicosis” is in practice applied also to fibrosis of the lungs due to certain silicates or to the combined action of free silica and silicates. Certain authors designate the fibrosis due to the action of certain silicates only, by the term “silicatosis”.

Silicon bioxide (silicic dioxide, silica SiO_2), a constituent of quartz and of silica, is very abundant in nature. Quartz forms principally sand, sandstone, granite, gneiss, etc.; silica in the state of an amorphous hydrate is found in various ores, in agate, flint, chalcedony, etc. In the state of silicates bioxide is present throughout entire mountain chains.

The following occupational categories are exposed to inhalation of dusts which are more or less rich in silica (quartz) or in silicates: coal miners, ore miners; workers in metallurgical trades, metal grinders, polishers using the sand blast; quarry men, stone cutters, especially those handling sandstone, granite and slate; workers in the asbestos industry, in the pottery industry, refractories industries and glass industry; grinders of silica and workers manufacturing polishing powders, mineral soap, enamels and silica paints, etc.

PHYSIOPATHOLOGY

The dust inhaled with the air is drawn by the respiratory current to the pharynx and bronchial tubes. Nasal respiration constitutes from the outset an important dust filter. The course of the dust in the respiratory tree may be roughly presented as follows: (a) particles which do not come in contact with the surface, and are breathed out again; (b) particles which come into contact with the walls of the bronchi and are

Though the concentration of siliceous dust in the air probably plays a rôle in the development of silicosis particularly in regard to the "time" factor, in the present stage of knowledge it is impossible to state definitely the level of dust concentration below which silicosis does not develop. It can only be stated in general terms that the higher the concentration the greater the probability of the development of silicosis and the shorter the time exposure¹ before silicosis is developed, other factors — such as the nature and proportion of silica dust — remaining constant.

Though it is current belief that particles of a size exceeding 10 μ do not penetrate further than the smaller bronchi, an opinion has at present been expressed that under certain conditions of the state of the bronchi, and more especially with

¹ As regards the duration of exposure necessary for the development of the disease, various authors suggest duration varying from eight to twenty-five years. In general, however, they are agreed on a figure of ten years as a minimum. Nevertheless, in the case of certain industries, for instance, sand blasting with compressed air, the manufacture of abrasive powders, the period of exposure may be reduced to two to three years.

The English Medical Factory Inspectorate publishes in its report for 1931 the following data relative to 205 fatal cases of silicosis and silicosis with tuberculosis:

	Number of deaths	Average age at death	Duration of employment in years		
			Shortest	Longest	Average
Silicosis	89	54.1	2.8	57	42.5
Silicosis with tuberculosis	116	51.7	2.0	57	32.5

Industry	Number of deaths	Average age at death	Duration of employment in years		
			Shortest	Longest	Average
Pottery:					
Silicosis	57	55.1	10.0	57.0	40.0
Silicosis with tuberculosis	50	54.4	21.0	57.0	40.4
Sandstone:					
Silicosis	19	56.9	20.0	57.0	39.8
Silicosis with tuberculosis	25	52.7	16.0	53.0	35.6
Grinding of metals:					
Silicosis	3	43.0	18.0	43.0	26.0
Silicosis with tuberculosis	20	50.4	2.8	46.0	31.2
Sandblasting:					
Silicosis	5	45.2	4.5	16.0	11.1
Silicosis with tuberculosis	15	45.4	2.5	20.0	8.6
Manufacture of scouring powders:					
Silicosis	1	24.0	7.0	7.0	7.0
Silicosis with tuberculosis	1	20.0	2.0	2.0	2.0
Miscellaneous:					
Silicosis	4	54.3	2.8	45.0	27.5
Silicosis with tuberculosis	5	50.0	11.0	34.0	21.8

(mouth breathing, and breath-
certain types of respiration and larger may arrive in the alveoli
lessness), particles of $10\ \mu$ and silicotic nodules. In regard to par-
and be found in anthracosis. Authorities consider these to be of no
ticles under $0.5\ \mu$ certain authorities stick to the mucus and are
importance, alleging that investigations on the other hand,
rejected with it. Other investigations these particles are by far the most
lead to the conclusion that these particles are by far the most
numerous and the most dangerous. However that may be, it
may be recognised that the majority of the dust inhaled with
the air becomes embedded in the mucus and is eliminated by
the action of the cilia (coughing, sneezing). A very small part
arrives in the alveoli, consisting of the particles having a dia-
meter inferior to $5\ \mu$, where as with regard to those of less than
 $0.5\ \mu$ in diameter, it must be borne in mind that investigations
have not yet reached the point at which a definite expression
of opinion can be given as to their relative number in the air
under working conditions, or as to their presence in the lungs
of silicotics¹.

The inhalation of silica is not in general accompanied by
signs of irritation unless it is mixed with irritant dust. It is
for that reason that workers exposed to silica have not the
least idea of the risk which threatens them, since silica may be
inhaled for long periods without causing much trouble, and
thus they often neglect precautionary measures and thus arrive
imperceptibly in the danger zone for the development of silicotic
lesions of the lungs.

The epithelium of the bronchi and bronchioli is not believed
to exercise phagocytic action on the siliceous particles which
on reaching the alveoli are embedded in phagocytes which become
what are called "dust cells". The reaction of the inter-alveolar
walls is on the whole fairly slight, and the siliceous dust cells
not eliminated by the respiratory passages tend to accumulate
in the alveoli or in certain alveolar channels which thus become
blocked with agglutinated dust cells. Masses of dust cells of
about 0.2 to $0.5\ \text{mm}$. form a veritable aggregations which have
undergone a kind of mummification caused within the proto-
plasm by the silica, and a

¹ In the South African gold mines 95 per cent. of the dust suspended
in the air of the galleries is inferior to $12\ \mu$. The majority of particles
found in the cinders of silicotic lungs are in general $1\ \mu$ and a very few
 $8.5\ \mu$ (McCrae); 93 per cent. of the particles extracted by acid digestion
of silicotic lungs were in size inferior to $2.5\ \mu$ (Moir), etc.

tissue or around the bronchioli and the arteries of the lobe.

By a mechanism not yet clearly specified, the dust cells thereafter penetrate into the interstitial tissue; septal cells and the covering cells become multiplied under the influence of the silica, and penetrate into the agglomeration of dust cells, and by fibroid evolution create after a certain time the pulmonary silicotic nodule.

The passage of dust cells or of dust itself takes place by way of the lymphatic current from the connective tissue to the intra-lobe lymphoid nodules where they form the "nodules de blocage" or "obstruction nodules" of Ickert, indicating that such nodules pre-existed, as certain authors are inclined to believe or that they were caused by dust, in accordance with the opinion of others.

The dust cells or free particles of dust, arrive at the trachobronchial-lymphatic ganglions by traversing the lymphatic vessels embedded in the connective tissue which surrounds the bronchial tubes and the blood vessels. Despite the fact that there is as yet no very definite information as to what occurs, it would appear that the drainage of siliceous dust is very inadequate, with the result that it finally encumbers the pulmonary tissue. The pathological problem may therefore be said to reside in disequilibrium between penetration (by inhalation) and elimination by the bronchi or lymphatic vessels of the dust.

When dust exercises an irritant action, there is noted a strong inflammatory reaction of the respiratory passage, which activates the lymphatic current, and results in favouring elimination of the dust. Under the opposite circumstances, the dust tends to accumulate in the lungs.

The silica intervenes in this case to exert its specific rôle.

Though it is not possible to exclude in an absolute manner all possibility of mechanical action due to the presence of very numerous silica crystals in the pulmonary tissue, it is at present recognised that silica exercises chemical action on the cellular protoplasm. Silica is not absolutely insoluble, experience having proved that in an alkaline medium such as that of the tissue juices, it becomes gradually dissolved¹.

¹ Silica is present in small quantity in the normal blood. Usually the silica content is increased in those suffering from silicosis (Böhme).

The reaction which occurs is still far from being clearly understood; the silica is transformed from a di-oxide, either directly into a colloidal compound, or first of all into silicates which the carbon di-oxide of the tissues decomposes into carbon and colloidal silica.

A fibroblastic action of the colloidal silica of the lungs is highly probable ; whether this action be due to colloidal hydrated silica or to the colloidal character of the product in question, the fact remains that in the silicotic tissue the mummified cells incapable of autolysis, and therefore of becoming dislodged, may block up the lymphatic capillaries and, by setting free by their destruction the silica which they contain, may extend the modifying action of the colloidal product to the neighbouring inter-cellular substances, which in their turn, becoming slowly but progressively modified, fall likewise a prey to the fibroid process of degeneration. The lymphatic current obstructed and retarded, favours in its upward flow lymphatic stasis and consequently peri-lymphatic sclerosis, the peri-adventitia of the bronchial tubes and blood vessels adjacent to the lymphatic passages is slowly but fatally involved in the sclerotic process, the obstruction proceeds and makes way for the development and outbreak of infectious processes and especially for tubercular infection (see later).

The mechanism which has just been outlined, as well as the conditions accompanying the development of fibrosis, is so far very little understood, a fact which must not be lost sight of. Animal experiment has succeeded in causing by means of dust, alveolitis, the formation of dust granuloma, but only with great difficulty that of nodules. When nodular formation occurs, certain experts are inclined to ask whether the cause must not be looked for in the intervention of the factor "infection" engrafted on the silica.

Up to the point at which the siliceous dust arrives in the tracheo-bronchial glands by way of the lymphatic passages, it is not possible to speak of a characteristic pathological condition. Silicosis is constituted as soon as there is noted a progressive development of fibroid tissue, the formation of typical nodules, and the recognised degenerative alterations. The participation of the bronchioli and adjacent blood vessels leads to peri-arteritis, and to bronchilitis with obliteration. of the vessels of the bronchioli.

On section, the pulmonary surface appears, even at an early stage, spotted with largely disseminated pigmented nodules, certain of which are hardly palpable. The tracheo-bronchial glands are slightly enlarged, strongly pigmented and may present foci of fibrous thickening.

Eventually, the nodules increase in number, diameter and density, and may form agglomerations or islets. The part of the lungs between the nodules may be emphysematous, the tracheo-bronchial glands are slightly pigmented, but may be of smaller diameter than those encountered in the early stages, and appear in a state of fibrous degeneration.

There is likewise encountered a form of massive extensive fibrosis having the tumour-like aspect of the terminal stages of silicosis. In this case, the process is entirely different from that of the agglomeration of nodules. Many experts are of opinion that serious silicosis may continue to develop, even after suppression of the initial cause (exposure to risk), and that there is no reason for excluding, at least in certain cases, the possibility of development terminating in a fatal issue, even without the intervention of tuberculosis¹.

Unfortunately, experience almost constantly proves the co-existence of the two diseases. Whilst, according to the data available, tuberculosis is predominant in the pathology of adolescence and of the early stages of adult life, statistics go to prove that it is present, *as a complication of silicosis*, most frequently in the second, and especially in the third and last, stages of that disease. Since it appears after a fairly long exposure to dust, it would seem that the incidence of tuberculosis amongst workers exposed to silicotic risks, coincides with a more advanced age (in general, forty years of age and over); in certain cases it is a question of infection of external origin, or of infection of the blood, which is engrafted on the silicotic lung, but in the majority of cases, it is possible to discover by persistent research that the bacillus was pre-existent to the silicotic lesions. Pathologists are still engaged in discussions on this aspect of the problem, and while some consider that the silicotic nodule is none other than sclerosis of tubercular origin developed around or at the level of an agglomeration of siliceous dust (there would always be in all cases of pulmonary fibrosis

¹ In animal experiment inhalation of silica has always led to production of *serious* silicosis (Gardner).

intervention of the Koch bacillus), later healed by fibrosis (Husten). Others are of opinion that tuberculosis only occurs as a constitutional factor favouring fibrosis. In many cases, laboratory research does not succeed in detecting the specific nature of the lesions, but merely proves that the tubercular and silicotic processes are so intimately interconnected, that it is even impossible to separate them anatomo-pathologically. It is certain that, according to the experiments, the cells altered by silica fall a prey to necrosis and constitute a good medium for the culture of the tubercular bacilli (Gye, Kettle) ; and that there appears to be diminished bactericidal activity on the part of the blood, that further, amongst animals inoculated with attenuated tubercular bacilli and having shown specific pulmonary lesions which healed after some months (which later at the autopsy showed insignificant traces of specific infection) inhalation of air highly charged with siliceous dust is capable of reviving in 73 per cent. of the cases, a tubercular process, this result not being obtained, for instance, with other dusts (anthracite, marble).

The reactivation of primary tubercles, an effect which is often followed by widespread chronic ulcerative tuberculosis, takes place only in those tubercles containing ample amounts of dust. Gardner believes that perhaps all tuberculosis complicating human pneumoconiosis is not necessarily an exogenous individual infection. In a certain proportion of the cases it seems probable that inhaled dust of the proper type may light up pre-existing quiescent foci of infection or disease.

Others (Haldane and Jötten) are of opinion that silica favours the development of tuberculosis by obstruction (*blocage*) of the normal lymphatic current by interference with the drainage of the lung. Other dusts, nevertheless (coal, for instance), encumber the lymphatic passages and favour stasis, without however, bringing about tuberculosis, which (at least in the form of tuberculosis of the usual type of evolution) is, as is well known, comparatively rare amongst coal miners.

Discussion is still in progress as to whether, in practice, the characteristic action of silica may be modified by the action of other dusts and whether this phenomenon is more marked in the presence of a complication (tuberculosis) ; experiments prove that silica shortens the period of development, *in vitro*, of the tubercular bacillus and creates a medium favourable

to its development *in vivo*, though its virulence appears to remain unaltered. Nevertheless the slight mortality from tuberculosis obtained experimentally by Jöten, with quartz having a high content of free silica, would appear to be explained — as stated by Smith and Collis in regard to ganister miners — by the presence of considerable quantities of oxide of alumina.

The same fact has been noticed by Heffernan amongst quartz miners in Derbyshire, and by Hayhurst amongst workers in sandstone quarries in the United States. It is thus seen that tubercular infection may modify the pathological aspect of silicosis. In this case, a biological reaction at times, enables detection of the tuberculosis bacilli to be made. In others, the co-existence of the two processes is readily recognisable ; in others finally, the tuberculosis veils and renders difficult diagnosis of concomitant silicosis.

Amongst other dusts, scouring powders, asbestos dust and coal dust have attracted the special attention of experts on the subject.

Cases of silicosis — in general acute — studied in workers engaged in making alkaline (abrasive) scouring powders prove that these products are liable to cause pulmonary lesions of a very serious type within a very short lapse of time (see English statistics, p. 212, footnote).

A series of fairly recent observations confirm the fact that the inhalation of *asbestos* dust is productive of specific pneumoconiosis, frequently complicated with tuberculosis and often terminating fatally. It is accompanied by the presence of “asbestos bodies”, though the simple fact that these are found in the lungs or sputum does not constitute proof of the disease. A radiological picture, on the other hand, is said to present special aspects, enabling differential diagnosis between asbestosis and other forms of pneumoconiosis and silicosis.

The problem of *anthracosis* is more controversial. It is more than a century ago since in Great Britain and Germany, etc., there was noted a superficial and deep-seated black coloration of the lungs of coal miners; yet at the same time it was observed that pulmonary trouble of a consumptive type was fairly rare, and even unknown in certain coal mining areas. During the nineteenth century the data furnished by medical men in the various countries coincided in recognising that pulmonary diseases of tubercular character were very rare

among coal miners, who, on the contrary, most frequently suffered from bronchitis and emphysema. Doctors as well as miners had for long noted however that the "black spit" was met with but rarely among hewers engaged in dealing with pure coal, and that it was principally, or exclusively, characteristic of drillers and those engaged in rock cutting. At this time, a movement originated in favour of correlation between the irritation and inflammation attributed to inhalation of dust raised through the cutting of hard rock and that found in stone cutters engaged in manipulating siliceous material.

In 1831 Gregory published the first chemical analysis (provided by Christison), according to which the black matter found in the miner's lung is indeed coal, and though subsequently it has been revealed that a slight part of the pigment (iron) may be of hæmatic origin, it is nevertheless true that the black coloration is in large measure due to particles of coal. Though it is not found in the lungs of pit ponies, this is explained chiefly by the fact that coal and schist dust are effectively eliminated by the respiratory apparatus of these animals. Whilst less intense in coal miners working in rock rich in silica, the black coloration is, on the other hand, more intense whenever the mine galleries are lit by acetylene lamps rather than by electricity. This is what happens, in general, in mines where the coal dust is present in by no means such large quantities as fine carbon dust¹ produced by lamps which smoke, dust which is utilised in medical experiment.

Pure coal dust does not appear to cause pulmonary sclerosis, developing into injury of an ulcerative type². This opinion is confirmed by the result of autopsies on Swedish miners who had worked in very pure coal embedded in friable schist, therefore in the absence of all hard rock. Edling has noted deep black coloration without the slightest trace of thickening of the connective tissue, nor of inflammatory cellular infiltration. This condition, when followed by pulmonary sclerosis, can

¹ Particles of carbon of a sooty variety cause tattooing of the lungs but not fibrosis.

² Lignite, particles of coal, difficult to distinguish from particles of soot, perhaps possess a sclerogenic action, but it is difficult to determine the particular action to be attributed to each of these varieties of dust, for particles of rock are frequently found in the miners' lungs. It is none the less true that intense sclerosis is met with in individuals who have never worked in coal mines.

only be attributed to the presence in the coal dust of silica, or silicates.

From the anatomo-pathological point of view it is often hard to distinguish clearly between anthraco-silicotic lesions, silicotic lesions, nodules, or zones of dense sclerosis which may contain at the same time particles of coal and of siliceous rock. It must be stated, therefore, that mixed cases are by far the most frequent.

Statistics prove that in coal miners the incidence rate of phthisis does not exceed and is often inferior to that for males in general. In Belgium an enquiry covering 1,200 miners has shown the presence of respiratory trouble in 95.5 per cent., of which 57 per cent. consisted in simple chronic bronchitis, 27.5 per cent. of bronchitis and more or less marked emphysema, 8.5 of asthma and 2.5 of suspected tuberculosis. In 1 per cent. only there was found active tuberculosis (Stassen). Another Belgian enquiry has revealed a rate of 34 per cent. for bronchitis, 4.8 per cent. for serious anthracosis and 2.13 for tuberculosis. Moore and Badham (1931), after examining 471 coal miners in New South Wales with at least ten years' working experience, found pulmonary fibrosis in 25.9 per cent., which affected 40.8 per cent. of those with a working experience exceeding thirty years. The development of the fibrosis was extremely slow, and there was no sign of tuberculosis.

Whilst, however, the English statistics confirm these facts, they at the same time indicate that at least in certain districts (Wales, for instance) coal miners pay a heavy tribute to tuberculosis. Enquiries effected in this connection prove that the siliceous element plays an important part.

Since it is true that coal dust acts in the manner of an inert substance and causes a slight reaction of mechanical nature, whence the formation of zones of emphysema, and that clinically this condition corresponds to symptoms of breathlessness commonly present in most miners with a long working experience, must the cause be sought in the fact that obstruction to self-drainage represented by the coal dust which encumbers the lungs and is in general inoffensive has the effect of neutralising the action of the tubercular bacillus?

It is believed that this dust does not possess the property of hindering the development of the Koch bacillus, that the previous anthracotic condition of the lung does not confer any

immunity against tuberculosis, and cannot modify its evolution¹; Far from doing so, according to certain authorities, the presence of coal dust is said even to favour the development of infection. It is true that others point to experiments calculated to confirm the contrary, but the majority of authors now deny that coal dust possesses any antiseptic property as regards the Koch bacillus. The hypothesis of at least partial adsorption by this dust of tuberculin has been favourably received, but still lacks confirmation.

There would therefore appear to be a close connection between the silica content of the dust in coal mines and the incidence of tuberculosis. The proportion of coal miners exposed to abundant inhalation of siliceous dust is always very low : 3 to 4 per cent. at most. Further, it would appear necessary to take into consideration such factors as : the personal factor, natural selection, medical selection, economic and social conditions, which play an important part. Where material living conditions, general health, sanitation as regards housing and working surroundings are not good, where natural or acquired immunity is interfered with, infection which has so far been latent finds in the organic resistance thus lowered a medium convenient for the revival and later the development of the bacilli. It is then that clinical tuberculosis breaks out.

STATISTICS

Though mortality statistics require to be interpreted with the greatest prudence, it may be stated that those provided by England and Wales certainly represent the actual facts more closely than others. They show for certain occupational classes an excessive mortality from pulmonary tuberculosis at later age-groups than those normally involved in the case of this infection, as well as an excessive mortality for other types of respiratory disease. Further, these excessive mortality rates of a specific nature are very high in occupations involving exposure to the inhalation of silica dust, a fact which has not been invalidated by later research. On the contrary, this association, apart from one doubtful exception, has been noted in all cases in which analysis has revealed the presence of silica. It is for this reason that English authorities are agreed that excessive mortality from tuberculosis and chronic fibrosis, affecting an occupational group as compared with the standard population,

¹ Perhaps a chronic fibroid form characterised by few symptoms, without bacilli in the sputum, with few signs of poisoning, but more especially with circulatory symptoms, is that most frequently found among these workers. Is it possible to regard this form, noted by medical men of an earlier date, as imparted to tuberculosis by coal dust ?

may be accepted as the measure of the silicosis risk for the group in question.

Parallel development between the presence of siliceous dust and occupational risk (respiratory disease) is shown according to the English statistics (1921) as follows :

STANDARDISED MORTALITY (COMPARATIVE MORTALITY FIGURES)
OF MALES AGED FROM TWENTY TO SIXTY-FIVE YEARS FROM
PULMONARY DISEASES IN CERTAIN DUSTY OCCUPATIONS,
COMPARED WITH THAT OF THE STANDARD TAKEN AS 1,000
FOR THE YEARS 1921-1923

	Diseases of the respira- tory system	Respira- tory tuber- culosis	Bronchi- tis	Pneumonia
All occupied and retired males	1,000	1,000	1,000	1,000
<i>Dusty occupations but with no silica dust risk:</i>				
Cement workers and lime burners	923	706	542	1,271
Sawyers, wood turners	774	978	792	694
Grain millers	992	714	847	978
Coal hewers and getters	1,146	686	1,425	978
Cotton spinners and piecers	1,273	1,072	1,431	1,180
Metal moulders	1,655	1,070	1,724	1,709
Coal-boat loaders and dischargers	1,913	1,018	1,982	1,959
Brick and plain tile makers, etc.	1,189	1,023	1,994	763
Cotton strippers and grinders	2,856	796	5,579	1,593
<i>Dusty occupations, with silica dust risk:</i>				
Tin and copper miners (not superintending staff)	4,348	8,847	3,887	536
Ditto: underground workers (not superintending staff)	6,329	12,607	5,004	840
Metal grinders	2,457	4,256	3,155	1,885
Masons, stone cutters and dressers, including those employed on limestone	1,632	2,032	1,994	1,072
Slate masons and slate workers	757	3,426	262	819
Potters' mill workers, slip makers, potters	2,856	2,750	5,435	1,242
Earthenware, china, etc., kiln and oven men	2,935	2,243	4,895	1,659
Grinders in the cutlery trades	4,611	7,878	7,282	2,439

Similar interest attaches to returns for mortality due to chronic interstitial pneumonia (fibroid phthisis, fibrosis, silicosis, miners' phthisis), without tuberculosis, which is of importance from the occupational aspect. Unfortunately, English statistics merely contain in this connection 498 cases which "are for the most part widely scattered in very small numbers, over the occupations dealt with, yielding as a rule quite insignificant death rates. There is however a very definite concentration upon a few occupations, represented chiefly by tin and copper miners, the comparative mortality figures (C. M. F.) for which, together with those for the social classes are as follows"¹:

¹ Registrar-General's Decennial Supplement, "England and Wales, 1921" (London, 1921).

	C.M.F.	Ratio
Occupied and retired males	1.34	1,000
Social category: I	1.05	784
II	0.96	716
III	1.73	1,291
IV	1.34	1,000
V	1.19	888
Number of cases		
39 coal miners, hewers and getters	3.34	2,493
10 making and repairing roads in coal mining	5.87	4,381
5 others below ground, ditto	1.45	1,082
5 above ground, ditto	1.84	1,373
5 iron miners	17.97	13,410
28 tin and copper miners	360.99	269,396
27 ditto below ground	546.31	407,694
9 stone miners and quarriers	11.58	8,642
— ditto igneous rock	—	—
1 ditto limestone	4.07	3,037
6 ditto sandstone	37.24	27,791
43 masons	29.18	21,776
9 ditto limestone	30.61	22,843
21 ditto sandstone	61.26	45,716
4 potters	17.20	12,836
3 brick and kiln and oven men	15.67	11,694
3 other makers of bricks and pottery	4.33	3,231
12 metal grinders	33.51	25,007
6 cutlery grinders	66.20	49,403
4 artists	20.13	15,022

Silicosis may likewise be detected by *systematic examinations* of all workers engaged in a given industry, clinical and röntgenological examination alone availing to reveal the incidence of pneumoconiosis. Enquiries of this kind must, however, cover several years, must include enquiry into cases of disease amongst workers absent from work, and must confirm, where possible by autopsy, the occurrence of fatal cases of pneumoconiosis diagnosed as such during the life of the patient (see below). It is possible to obtain statistical information on the basis of cases compensated and likewise on the basis of fatal cases notified and verified.

For *Germany*, see statistics on page 43.

A report for 1931-1932 by Professor Koelsch, District Medical Inspector, contains more detailed data on cases of silicosis notified in Bavaria.

Cases of serious pneumoconiosis (silicosis) amounted in 1931 to 233 (47 per cent.) of the notified cases of occupational diseases) and 137 in 1932 (38 per cent.). In 79 and 77 cases respectively those affected were workers in the sandstone industry; in 146 and 56 cases those affected were workers in the pottery industry and in the 8 and 4 remaining cases workers in dusty trades not covered by the Compensation Act (metal grinders, file makers, workers using the sandblast, etc.

For *Great Britain*, the incidence from 1929 to 1931 was as follows :

	Cases	Deaths
Ganister mines and silica brickworks	80	30
Getting and manipulation of sandstone	179	25
Pottery industry	322	87
Metal industries (metal grinding and sandblasting)	81	32
Coal mines	91	20
Total	753	194

Despite the fact that statistics furnished by enquiries and studies made by medical experts in the various industries and countries are not comparable one with another, the most recent figures thus assembled once more confirm the data furnished by the English statistics.

Grouped roughly in accordance with similar trades, the following figures may be quoted :

Sand blasters (Lochkemper, 1930): 25 workers examined, with a working experience varying from 5 months to 14 years: radiographic examination revealed: free from sclerosis, 5; silicosis, first stage, 12; second stage, 5; between second and third stages, 1; third stage, 2.

Cleaners and trimmers of castings (Landau, 1932): 25 cases observed, 11 of which were silicosis (2, first stage; 1, first-second; 4, second; 3 second-third; 1, third) and 14 tuberculosis with or without silicosis. The majority of cases studied affected workers aged from 40 to 50 and showed a typical picture of tuberculosis of rapid evolution, which, accompanied by silicosis, developed suddenly starting from small round foci which rapidly coalesced. Serious cases of silicosis and silico-tuberculosis are unfortunately very frequent amongst workers (not covered by compensation for occupational diseases).

Ditto (1933): Regular periodical examination of cleaners of castings (exclusive of those using the sand blast) has proved the grave risk incurred by 126 trimmers (69 per cent. silicosis). Open tuberculosis was present in 10 cases (8 per cent.). The opinion expressed by authorities on the subject relative to varying degrees of risk for trimmers of iron and steel castings is confirmed: 44 trimmers of iron castings, 15 per cent. of silicosis, second to third stage; 56 trimmers of steel castings, 32.1 per cent. (with open tuberculosis). In 53 fatal cases affecting trimmers of iron castings, respiratory diseases accounted for 58.5 per cent. of the cases.

Slate workers (rich in quartz) (Groetschel and Gutzeit, 1932): 70 workers examined, 17 suffering from serious silicosis, 11 of these being complicated with tuberculosis; 11 with slight silicosis; 3 border cases.

Slate milling and talc mining (Enquiry of U.S.A. Public Health Service, 1932): The slate is finely pulverised and then used in making a coating composition for roofing material; 52 to 1,440 million dust particles per cubic foot were found in the workshop; 19.3 per cent. of 57 talc workers, and 87 per cent. of 79 slate millers showed on X-ray examination changes in the lungs which were slight in all cases except those of 4 slate workers, and which were unaccompanied by any disability.

Granite workers (Groetschel and Gutzeit, 1932): 49 workers examined no serious silicosis.

Ditto (O'Brien, United States, 1928): Period of observation, 1922-1927; tuberculosis mortality, 41 per cent.: other respiratory diseases, 13; circulatory diseases, 13; other diseases, 20; violent death, 7; unknown cause, 6.

Tuberculosis mortality was shown to be 652.4 per 100,000, as against 100.1 for all males in New York.

Another American enquiry conducted amongst granite workers at Barre (total silica 70 per cent., of which 50 per cent. was free silica, 15 per cent. alumina; the size of the dust particles was inferior to 10 μ , therefore dust of a most dangerous type). The workers were divided into four groups according to the dust concentration to which they were exposed: (a) 59.2, (b) 45, (c) 20, (d) 10, parts of dust per cubic foot. The statistics furnished prove that the worker exposed to this dust in the long run falls a victim to silicosis.

For 1,000 years of observation there were found:

	Granite	Gold-bearing rock	Cement	Iron and steel	General statistics
Total number of diseases* (with at least 8 days of absence)	176.1	207.9	155.9	70.1	86
Number of respiratory diseases . (comprised in the preceding total)	120.4	107.4	89.1	33	40.1

In the group (a), at the end of fourteen years those exposed were all confirmed silicotics. The incidence of active tuberculosis increased with the working experience: after twenty-five years it was over 15 per cent. Whilst abundant inhalation of dust is generally well tolerated after a lapse of two to three years, gradually as the pathological process develops dyspnoea (principal symptom) and organic lesions set in.

Granite (Sutherland, Bryson, Keating, quoted by Middleton): 494 workers examined, 211 of them by X-rays. There were found clinically 260 cases of fibrosis (52.6 per cent. of the workers examined); and radiographically 17 cases (20 per cent. of those examined radiographically).

Quartz (Mascher, 1930): 32 workers examined; intense dust concentration with 99 per cent. silicic acid; radiographical examination revealed: silicosis, first stage, 11; second, 3; third, 7; doubtful, 5; without silicosis, 6; period of latency, 1 year. Two autopsies revealed silicosis without tuberculosis. The workers in question were aged 20 to 40 and were strong athletic types. In 12 cases radiography revealed former or recent foci of tuberculosis without any influence on silicosis or of the silicosis on tuberculosis.

Silica milling (Kessler, 1931): 6 fatal cases following exposure to silica dust (99.24 per cent. of free silica) lasting from 4 to 18 months. The sand was pulverised to fine powder for use as an abrasive.

Abrasive soap manufacture (Chapman, 1932): 3 cases, 2 of which were fatal. Length of exposure to dust 8, 29 and 36 months.

Abrasive powders (Clark, 1929): 137 workers, with a working experience of 10 to 42 years, were examined, engaged in manipulating artificial abrasives with very little silica (9 per cent.); 42 were free from silicosis; 12 had slight silicosis; 77, first stage; 6, second stage. In 11 cases radiography revealed an old inactive tubercular process. Of 69 workers examined in 1924 by X-ray and again in 1928, 12 showed no signs of silicosis; 11, premonitory signs; 43, silicosis of the first stage; 3 of the second, probably true silicosis.

Diatomaceous earth (Legge and Rosencrantz, 1932): containing 85 per cent. free silica, chiefly in the amorphous form. Amongst 108 men examined 15 per cent. suffered from moderately advanced silicosis and 6 from advanced silicosis.

Mirror polishers (Koelsch and Lederer, 1931): 174 workers examined at Fürth, where tuberculosis has for long been recognised as typical of the industry (Fürth disease), although no attempt had been made to associate the disease with dust inhalation. Length of working experience: 9 and 10 years. Clinically: 118 cases with sound lungs; 26 with pulmonary tuberculosis (7 cases of open tuberculosis); 15 cases of pneumoconiosis (of which 4 were tubercular); 13 cases of bronchitis.

Radiographically, 99 workers examined were classed as follows: 54 negative; 17 pneumoconiosis, of which 4 were tubercular and 2 with broncho-pneumonia; 18 pure tuberculosis; 7 with positive sputum. Typical radiological picture, nodular after 10 to 20 years of working experience.

Metal casting (Quarelli and Boidi-Trotti, 1931): 103 workers examined, complete examination being effected in 23 cases: 11 cases of pneumoconiosis, of which 4 were first stage; 5, second stage; 2, third stage. Radiography revealed 11 cases of tuberculosis.

Sandstone (Sutherland and Bryson, 1929): 454 cases examined, 266 radiographically: clinically, 268 cases of fibrosis were noted; radiographically, 112 cases of silicosis (43 per cent. of those examined radiologically), of which 90 were first stage; 21, second; 1, third). One man in four was affected by the disease.

Refractories industries and furnace making (Saupe, 1931): 38 workers with 6 to 50 years' working experience examined: radiography revealed 4 cases of first stage; and 2 between the second and third.

Ditto (Hayhurst and collaborators, 1929): 919 workers observed during 3 years, and 912 radiographs made revealed: 260 silicotics, 13 of whom were tubercular; 238 cases of pulmonary fibrosis; 5 of simple tuberculosis. Pulmonary lesions were noted in 55.1 per cent. of the cases, comprising 28.5 with silicosis in varying stages. Tuberculosis without silicosis showed a rate of 0.5, and if cases of silicosis plus tuberculosis be added, 1.9. Tuberculosis was revealed to be two times more frequent than amongst the inhabitants in the surrounding district, and to exceed by 70.6 per cent. the rate for the neighbouring industrial town. The period preceding the outbreak of silicosis (about 16 to 24 years) is double that found elsewhere. The rock contains 92.45 to 95 per cent. of crystalline silica. Those conducting the enquiry attribute the low incidence of tuberculosis to the presence in sufficient quantity of dusts said to exert a protective effect as regards the action of silica.

Ditto (Kœlsch, 1932): 234 workers examined. Clinically, 15 without symptoms; 26 with more or less marked pulmonary symptoms; 4, phthisis; 5, long-standing or recent bronchitis; 5, marked emphysema; 2, sequelae of pleurisy. Radiographically: 23 cases of definite pneumoconiosis; 18 slight; 2, silico-tuberculosis; 7, pneumoconiosis plus tuberculo-sclerosis.

Ditto, Cryolite, with only 3 per cent. of quartz (Gudjonsson, 1933, Denmark): 78 workers with over two years' working experience in grinding. Symptoms of silicosis were found in 39 cases and were distributed as follows:

Years of working experience	Number of workers	Free from silicosis	Slight silicosis	Silicosis of the second stage	
				Slight	Marked
2	22	18	3	1	—
5	38	17	6	12	3
10	4	—	1	3	—
15	6	3	1	1	1
20	8	1	3	2	2
— 10 years	60	—	—	16	(22.7)
+ 10 „	18	—	—	12	(66.7)

Cement (Van Bemmél, 1931): 469 workers examined with a working experience of 1 to 20 years. Slight respiratory diseases, 71; chronic bronchitis, 26; pneumoconiosis, 18; pure tuberculosis, 16; doubtful cases, 10.

Ditto (Feil, 1931): 157 workers examined with 3 to 10 years of working experience: non-tubercular pulmonary lesions, 5 per cent.; specific lesions of long standing, 4 per cent.; tuberculosis in course of evolution, 1.25 per cent.

Ditto (Wischnewsky, and others, 1931): 150 workers examined: pneumoconiosis, 13.3 per cent.

Porcelain (Karpilowsky, 1929): 102 workers examined: 11 cases of pure tuberculosis; 49 cases of pneumoconiosis with tuberculosis; 24, pure tuberculosis.

Ditto (Hoffbauer Flatzeck, 1932): radiographs made of 1,339 workers; amongst 100 porcelain workers with 11 years' working experience and upwards, in various occupational processes, the following showed silicosis of average or intense severity: finishers, 57.3; porcelain turners, 54.3; assemblers, 46.6; porcelain painters, 44; jiggers, 41.7; polishers, 40; grinders of pebbles, 23.5; grinders of refractory material, 17.1; oven men, 9.3.

Fine china (Czarnecki, Thiele, 1932): 208 workers examined. Clinically: no tuberculosis, 111; suspected cases, 83; latent cases, 11; active cases, 3; free from pneumoconiosis, 129; doubtful, 11; first stage, 34; first to second stage, 59; second stage, 44; second to third, 11; third, 22.

Mines and tunnels (Gold Mines of Western Australia, 1928 Enquiry): 4,067 workers examined revealed: 19.6 per cent. of pulmonary silicosis and 3.8 per cent. of pulmonary tuberculosis. Of 56 underground workers, 23.3 per cent. showed silicosis; 5 per cent. silicosis plus tuberculosis; and 0.3 per cent. pure tuberculosis.

Ditto (Broken Hill, Smith, 1924): 8,966 miners were examined; amongst these the silicotic subjects showed themselves to be 23 times more susceptible to tuberculosis than those who were not silicotic. 322 cases showed injuries due to dust. Amongst these, 148 (46 per cent.) were tubercular. Of 174 silicotic cases without tuberculosis, which were removed from the mines and kept under observation, 37 developed tuberculosis in 18 to 24 months, those who had emigrated into the town or into congested areas being more readily affected. It was believed that the cases in question consisted of superimposed infection and not of revival of long-standing infection. Of 8,644 miners free from changes due to dust, 161 (2 per cent.) only were tubercular.

Ditto (Fisher, W. O., 1932, South Africa): observations dealing with native miners from 1921 to 1931: 561 autopsies were effected.

PRINCIPAL CAUSES OF DEATH REVEALED BY AUTOPSY

Year	Autopsies effected per annum	Pulmonary tuberculosis	Pulmonary tuberculosis and silicosis
1929.	223	3	7
1930.	182	5	—
1931.	156	4	1
Total	561	12	8
Total for the years 1922-1928 . . .	1,402	48	30
Total for the ten years 1922-1931 .	1,963	60	38

Mines and tunnels (Irvine, 1929): European miners in South Africa observed during a period of 11 years: 4,092 cases of simple silicosis;

377 of tuberculosis with silicosis; 365 of simple tuberculosis, in a population of 13,436 working miners; annual average for the period under review, about 2.76 per cent.

Ditto (Schürmann, 1929): Amongst 3,149 coal hewers in the Ruhr mines examined by X-rays 14.7 per cent. showed lesions of slight silicosis, 2.3 slight to average, 1.84 average, 0.42 average to serious, and 0.18 serious.

Ditto (Husten, 1931): 240 autopsies of miners working in the Ruhr and engaged in rock drilling: 177, with very marked silicosis of nodular type; 35, without nodules. There was a higher mortality between the ages of 50 and 55. Of the 96 most serious cases: 37 occurred under the age of 50; 33, from 50 to 55; 26 above that age; 4 over 60. Of 173 serious cases, 120 (69 per cent.) had active tuberculosis; of the most serious cases only 41 per cent. The youngest worker affected by the most serious form was 37 years of age. 76 per cent. of the most serious cases died from cardiac insufficiency; 9 per cent. from tuberculosis: 14 from pneumonia. The working experience varied from 3 to 35 years. Silicotic workers suffering from tuberculosis had worked for the shortest period: 3 to 4 years. The average duration of work for all workers was 14 to 23 years. 175 workers examined suffered from serious silicosis subsequent to the appearance of the usual symptoms (dyspnoea, cardiac insufficiency): of these 9 died prior to compensation; 31 in the first year of compensation and later. Only 36 were living after 4 years and 3 after 6 years.

Ditto (New South Wales coal mines, 1930): Silica content from 0 to 35 per cent. 471 miners with at least 10 years' working experience, 25.9 per cent. with fibrosis. Amongst those who had worked under 10 years no fibrosis was noted. 40.8 per cent. occurred amongst those with upwards of 30 years' working experience. Radiographical examination showed 6.6 per cent. of active, latent or cicatricial tuberculosis, especially in workers having 21 to 30 years' working experience.

Ditto (Western Australia, Kalgoorlie gold mines. Permanent enquiry into the state of the workers' health commenced 1926). 20,000 workers were examined. In 1926 amongst over 4,000 miners the rates were as follows: Silicosis 16 per cent.; silicosis + tuberculosis 3.5 per cent.; tuberculosis 0.3 per cent. In 1927 amongst 2,290 miners 98 per cent. were free from respiratory lesions; in 1928 the percentage was almost similar. In 1929 2,317 were examined and the rate fell to 94 per cent. In 1930, out of 2,937 miners the percentage was 93; in 1931, out of 2,653, 95.5 per cent.; in 1932, 3,264 miners, or 98 per cent., were free from pulmonary affections. Since 1926 the health supervision service has discharged 298 miners suffering from tuberculosis and discovered 267 suffering from silicosis and tuberculosis. For 18,000 normal subjects there were 800 silicotic miners. Prophylactic measures adopted in the gold mines have attained their object, for the number of miners suffering from silicosis has been reduced from 16 to less than 3 per cent. in the last 7 years.

The importance of the silica content of the dust¹ with regard to the incidence of respiratory disease and pulmonary tuberculosis in particular is proved by the following data referring to Great Britain (quoted by Collis in 1926, in *Occupation and Health*):

¹ Determination of free insoluble silica in the tissues is not in itself sufficient for estimating the danger possessed by a type of dust. Further the varied methods of dust sampling are of considerable importance as regards the result of the analysis. It is for this reason that these methods require to be subjected to strict revision and in analysis of silicates it would be necessary to separate the smallest dust particle (by means of the Kohn pipette) prior to the main analysis (Jöften and Sartorius, 1933).

Occupation	Composition of dust		Annual death rate per 1,000 living	Deaths from phthisis expressed as percentage of deaths from all causes
	Free silica	Other constituents		
Flint knappers (Brandon)	100 per cent.	—	41.0	77.8
Ganister miners (Stockbridge)	95 „	—	22.3	67.8
Tin mining	75 „	Tinstone, feldspars and micas	17.6	42.0
Sandstone masons (Grinshill)	Up to 95 per cent.	—	16.7	52.4
Grinders (Sheffield)	50-100 per cent.	Some oxide of iron	15.0	49.7
Gold mining (Transvaal)	Gold bearing quartz, i.e. silica	—	—	42.1
Granite cutters (Aberdeen)	30 per cent.	—	5.7	38.0
Potters	Flint, i.e. silica in certain processes only	(Alumina) China clay	3.1	18.9
Brickmakers	—	Alumina & silicates	2.1	10.1
Gypsum, cement, asphalt workers (Switzerland)	—	Calcium sulphate, silicates, etc.	1.9	—
Slate quarrying	A small amount	Chiefly aluminium silicate	1.8	15.4
Millers	—	Carbohydrate	1.4	9.1
Coal-mining	—	Coal measures	1.0	9.8

SYMPTOMATOLOGY

Medical authorities are agreed that the most thorough-going clinical examination possible, together with technically perfect radiographic findings enable the amount of physiological incapacity to be determined and diagnosis of silicosis to be made.

Pulmonary fibrosis may at the outset not be disclosed by subjective phenomena but already at an early stage radiographic signs are visible. There is generalised accentuation of the shadows of vascular and lymphatic arborisation (peri-vascular and peri-bronchial fibrosis) which is, however, peculiar to all chronic irritation of the respiratory passages. No small mottling is noted. Chronic bronchitis or pulmonary stasis have the same aspect but in cases of pneumoconiosis of occupational origin the hilar shadow is more marked.

The above-described conditions are said by certain authorities to constitute a very early stage of silicosis, which they name "ante-primary". It may seriously be doubted whether this constitutes a pathological entity which may be definitely identified with silicosis.

In practice three stages are distinguished for classification : early silicosis, or first stage ; intermediary silicosis, or second stage ; advanced or serious silicosis, or third stage, all characterised by fairly distinct clinical and radiographic symptoms, though tuberculosis may at times complicate the silicosis at any of these stages.

Initial Stage

The principal symptom and the first to appear in individuals suffering from early silicosis is dyspnoea. At the outset slight, and brought on by effort (breathlessness on effort), it increases progressively as the pulmonary sclerosis extends. It is of earlier appearance amongst subjects with limited chest expansion whose respiratory reserve is more rapidly exhausted, or amongst those with a tendency to bronchitis. In general the patient appears in good health, but he may complain of dryness of the throat, breathlessness, and at times of attacks of coughing. Respiratory symptoms are slight or absent. The working capacity in general remains normal, or but slightly affected. In presence of these functional symptoms clinical examination merely reveals diminished chest expansion, harshness of sound on percussion and of the vesicular murmur on sounding. Expiration is prolonged and at times accompanied in certain occupations (metal grinding) by rales or rhonchi.

Careful radiographic examination will at this stage show certain modifications in the respiratory apparatus, significant among which is the presence of small shadows indicating fine and discrete nodulation. Increase of fibrous ramification and of peribronchial shadows may also be present but are not necessarily pathognomonic of silicosis. A careful examination by means of the fluorescent screen may show also some limitation of diaphragmatic movements.

Second Stage

The phenomena of the first stage become accentuated. The chest is in a position of partial expansion. Its expansion

is more limited in the basal and apical regions. Accessory muscles are brought into play in ordinary breathing. Deep breathing is impossible. This can be ascertained by the duration in length of time for which the subject is able to hold his breath during examination of the heart. Breathlessness on effort increases. The general health may not show any marked changes at this stage but there is already a certain incapacity for work which is nevertheless not total. There is at times normal resonance on percussion and at times hyper-resonance in certain places and zones of dullness elsewhere. On sounding the vesicular murmur is thinner in volume and diminished in extent, which implies difficulty in the intake of breath. Inspiration is shortened, jerky and harsh, expiration prolonged, with a vesicular murmur. These signs, which are fairly characteristic, are met with at the outset more distinctly in the posterior and subsequently in the interior and lateral regions, at times being more marked in one lung than in the other. In the most advanced stages the murmur has a whistling sound, sometimes soft and sometimes tubular in quality. Dry rales constantly accompany this condition which, however, gives no physical symptom other than true infrequent crepitation, indicating where there is a certain intensity and a certain dissemination, concomitant broncho-pneumonia due to bacterial infection, most frequently of tubercular nature.

Symptoms of recent or long-standing pleurisy may be noted, dispersed rhonci, zones of sub-dullness and generalised harsh pleuritic rubs in the sub-axillary region. The cough is dry with little or no sputum. The patient becomes more susceptible to slight attacks of bronchitis. He complains of transitory pleuritic pain.

The radiograph reveals an accentuation, not always constant, of hilar shadows and the number and dimensions of the area of mottling, signs of isolated nodules which in certain zones tend to run together. In other zones numerous small patches of typical mottling, round in shape and varying in size from a pin-head to that of a pea, are found more or less regularly distributed but rather symmetrically throughout the two lungs, except perhaps at the beginning of this stage, where they predominate in the right rather than in the left lung. They are also denser around the hilar shadows, the clear zones (filled with air) are increasingly reduced, the general effect recalls

that of more or less extensive mottling, which has been described under that appellation "snow storm", commencing on the right side and spreading to the left. Where the mottling is generalised there is, as a rule, no appreciable difference between the two sides of the chest. In confluence the nodules form aggregations constituting "plaques" or islets of medium or large dimension, in general symmetrical on both lungs, but of specially frequent occurrence in the infra-clavicular region, or in the lateral regions in the second stage, and still more rarely, below the hilar shadows. The movement of the diaphragm is limited only in regard to its internal part, but the total movement may be interfered with as in the third stage. Careful control of the function of the diaphragm is useful in estimating the extent of the broncho-pulmonary injury. In theory it might be expected that to the findings corresponding to the first stage would be added nodular fibrosis of the second stage, but this is not always the case. More frequently the hilar image and that of the broncho-vascular system are no more marked than in the former case. This may perhaps be explained by the presence of emphysema which veils the radiological picture, but there should also be taken into consideration the possibility of the presence of lymphatic stasis in peripheral zones of the lung and of thickening of the pleura.

Radiographs of the second stage are so typical that at this point the disease can no longer be confounded with others by those familiar with examinations of this kind. It is here seen once again that the gravity of the radiographic lesions do not correspond to the clinical picture of relatively slight importance, in which, however, the symptom of "breathlessness on effort" continues to predominate. Miliary tuberculosis, and perhaps that of broncho-pneumonic form, may be fairly readily excluded after adequate examination of antecedents, occupation and clinical examination.

At the outset differentiation from early tuberculosis of the apex may be possible in several cases, but later, especially where the lesion is bordering on a third stage, it becomes more difficult, if not impossible. It is true that the apices remain, until a late period, relatively free from silicotic invasion, which may at times represent a valuable element in differential diagnosis.

Third Stage

Functional signs become more serious : very trying dyspnoea even while at rest, the patient has an anxious expression, the chest is rigid, retracted without expansion even on forced inspiration. Breathing is diaphragmatic, the irritant cough increases in frequency, with expectoration, usually slight, but in certain cases abundant. There may be cyanosis. The patient suffers from *serious or total* working incapacity.

On percussion there is diminished resonance amounting to dullness, especially in the upper and middle regions and more definite and general in one of the lungs. The presence of more or less extensive parallel zones in a silicotic lung point, though not invariably, to tuberculosis. These signs may however, be lacking even in advanced cases. The respiratory murmur is weak or harsh, or more rarely, bronchial. There may also be rales or rhonci. As regards the heart, there are at times signs of dilitation of the right heart or of cardiac insufficiency (œdema, serious cyanosis, etc.).

Radiographically the surface of the lungs increasingly assumes the "snowstorm" aspect. Whilst, as has been said, the passage from the second to the third stage is at times difficult to determine, a useful accessory factor is provided by examination of the movement of the diaphragm. In the third stage there is generalised mottling, enlarged or even voluminous islets, flat and dense and most frequently arranged symmetrically throughout both lungs. They are localised preferably in the lateral regions of the middle and upper parts of the lung and between these are seen clearer zones of emphysema, which in the most serious cases are reduced to a minimum. Other cases are met with, however, in which the radiographic pictures are most usually very irregular, being due to the confluence of nodules which render differential diagnosis almost impossible.

These types ¹ have, however, certain aspects in common : very marked accentuation of the shadows of vascular arbori-

¹ In order to make the cases diagnosed in daily practice fit in more satisfactorily with theory, Devoto distinguishes (a) typical pneumoconiosis represented by serious silicosis, with or without tuberculosis, confirmed by occupation, social conditions, clinical and radiographic findings; (b) slight forms of pneumoconiosis, corresponding to the first stage of silicosis of serious evolution, without, however, progressive development, often stationary, characterised by fibrosis (with fine mottling) which may be due to other dusts apart from the more abundant silica. Here it is a question of changes typical of dust but not specific

sation, linear bands or shadows directed especially towards the base of the lung, vague outline of the diaphragm. There may be in the diaphragm dome-shaped formations drawn upwards by adhesions. In advanced cases there is retraction of other organs or parts of the organs of the chest.

Although the division of silicosis into three stages for purposes of clinical and pathological classification and even compensation has proved to be workable in practice, for purposes of compensation such a division may be difficult in certain countries and certain industries. Where the degree of disability is the determining factor in compensation, other methods of division of silicosis might be adopted for legislative purposes.

COMPLICATIONS

It has been said that pulmonary tuberculosis may occur as a complication at any stage of silicosis, accentuating its development and that silica favours the outbreak of tuberculosis. It is true that tuberculosis modifies the symptomatology, the physical symptoms and the radiographic findings of silicosis ; it governs the degree of working incapacity by reason of the fact that it also changes the classification into three stages of silicosis. Many authorities propose, for practical purposes, a reduction of these stages to two, investing the loss of functional capacity with a greater importance than that to be attached to the physical and radiographic symptoms.

Certainly the problem at issue is complex, difficult and has occasioned much discussion. It is a question of two conditions strictly inter-connected, the development of which is favoured or retarded by several factors, either constitutional or environmental. It is certain that tuberculosis by its frequent incidence, the disability which it causes and the high mortality rate which it creates, constitutes a very serious aspect of silicosis.

Tuberculosis is a frequent complication of silicosis in certain industries. In others it is not so frequent. Tuberculosis may manifest itself in the very earliest stages of silicosis, or it may not manifest itself until a very late stage of silicosis is reached. Under certain conditions tuberculosis complicating silicosis appears to be less toxic than a similar degree of tuberculous lesions in a case without silicosis. On the other hand, in South Africa tuberculosis complicating advanced silicosis has proved to shorten the expectation of life very considerably. It is therefore impossible at the present stage of knowledge to pronounce categorically on this matter.

Tuberculosis is to be suspected in a silicotic subject when there occurs a sudden outbreak of toxæmia : high irregular temperature, night sweats, loss of weight, formation of cavities, hæmoptysis. This form, as well as that of pneumonia, broncho- or miliary-

as regards the causal agent (i.e. the type of dust); (c) coniotic manifestations of non-typical character associated with ordinary pathological effects, at times in the absence of clinical and radiological signs.

pneumonia, may be more frequently met with in the first two stages than in the third, in which, on the other hand, tuberculosis occurs in a chronic form : silicosis with its sclerogenic property in general imparts a fairly slow evolution to the infectious process.

Where the evolution of tuberculosis is, on the other hand, accelerated, symptomatology is represented by a sudden and rapid decline of the general condition, incapacity for work which precedes even the pathological symptoms, acceleration of the pulse, attacks of pleurisy — often the first sign of the tuberculosis — of night fever and abundant expectoration. Abundant attacks of hæmoptysis are rare. On the pulmonary surface there are noted zones of condensation with bronchial murmur and crepitations, and at times the formation of cavities. Until the end the most important symptom is dyspnoea, which is out of proportion to the pathological changes even in the presence of tuberculosis. When the specific lesion dominates death occurs fairly rapidly as the result of progressive and exhausting asthenia, or more rapidly by hæmoptysis. In cases in which advanced sclerosis dominates the evolution is slower and death occurs with a picture of respiratory distress and cardiac insufficiency.

It has already been mentioned that according to certain authorities the cavities found in the coniotic nodules are characterised by a special pathogenesis and form a special type of picture which distinguishes them from cavities of tubercular nature, and that silica may bring about the formation of nodules and islets without the intervention of the Koch bacillus. It has likewise been seen that in accordance with the views of the majority of medical authorities the silicotic process appears to intensify around a former tubercular focus and that an association of the two processes forms the most common origin of zones of massive fibrous consolidation.

On radiological examination concomitant tuberculosis is to be suspected when alongside areas of small generalised mottling in the two lungs there is noted large unilateral shadows or signs of injury at the apex of the lung which is more serious than that found in the other parts of the lungs. In tuberculosis, especially at the outset, there is noted the “vertical heart”, the cardiac shadow losing its usual contour to become narrow and apparently elongated. Alongside the hilar images, which are more extensive and more accentuated, stand out the thick, clearly outlined shadows of the calcified lymphatic glands, especially in old healed cases. A more or less symmetrical accentuation of the shadows of the larger bronchi associated with calcification of the bronchial ganglions indicates healed peribronchial tuberculosis.

As tuberculosis advances there are noted numerous opaque zones in one or other of the lungs and at the same time signs of silicosis. Under these circumstances the radiographic images provided by tubercular lesions are not always clearly defined and it is not always possible to say which of the two processes predominates and to adopt with certainty the terminology reserved by certain authorities for such cases, namely, “tuberculo-silicosis” or “silico-tuberculosis”.

The positive proof of the Koch bacillus in the sputum is generally late of appearance and the number of bacilli a minimum.

Careful clinical and radiographic examination, repeated analysis of the sputum, enable the intervention of the bacillus of Koch to be confirmed and the diagnosis of silico-tuberculosis to be made in a

considerable number of serious cases of silicosis. Nevertheless, at the autopsy it often occurs that tuberculosis not diagnosed "in vitam" is discovered.

As regards anthracosis or anthracotic fibrosis in coal miners¹, it is sufficient to recall that the classic form of parenchymatous condensation and the presence of cavities is not generally met with except in the presence of tuberculosis. The latter becomes engrafted on anthracotic fibrosis in individuals aged forty to sixty, influencing its evolution. These miners at the confluent fibrotic stage suffer from caseous pneumonia which appears to be less serious amongst those cases in which the disease is still at the nodular stage. Nodular anthracotic fibrosis and more especially the type showing confluence of the nodules represents a state of "anergy" as regards the tuberculosis which is shown in the appearance in old fibro-anthracotic miners of very serious and specially acute forms of pulmonary tuberculosis. The common form of phthisis or cardiac failure brings about death (Courtois).

DIAGNOSIS

Reference will merely be made to acute *silicosis* by way of recapitulation. Medical literature contains references to several cases, most of them fatal, occurring after eight, twenty, or thirty months of exposure to alkaline dusts very rich in silica or to quartz dust. It is a question of serious silicosis of more rapid development than usual and which in general affects fairly young workers.

As regards diagnosis of *chronic* cases the anamnestics, examination of the respiratory and cardiac functions, clinical, bacteriological and radiological examination form the indispensable basis of diagnosis.

Examination of the case history must be very thorough and should include all precedent history of the patient, especially with regard to his occupation (length of exposure to siliceous dust). It has already been seen that whilst in general working experience of ten years and upwards is necessary, serious cases have nevertheless been met with even after a shorter lapse of time — two to four years.

Functional examination of the respiratory apparatus (chest expansion, vital capacity, breathing capacity, etc.) should be completed by examination of the cardio-vascular system. It is necessary to insist once more on the importance of clinical examination and enquiry into functional limitation, which

¹ Extensive non-tubercular pulmonary lesions are only found amongst coal miners exposed to the inhalation of siliceous dust liberated during drilling of seams of non-coal-bearing rock. Coal dust alone merely produces very slight increase of connective tissue.

very often permits of the diagnosis of early or serious cases. In such cases the anatomical and functional findings usually confirm each other when the radiographic picture supplies no positive data, or at least does not provide specific signs of silicosis. Breathlessness on effort should be looked for and it should be ascertained whether it may not be due to other diseases. Czarnecki points to the value of the symptom of Espine ("blowing" breathing noted at the level of the spinal column), tracheo-bronchial adenopathy which becomes more marked as the radiographic image portrays increasing severity. This phenomenon, which is generally intermittent, would appear to indicate the presence of silicosis amongst young workers and to be due to a secondary tubercular process not so far developed at the level of the hilum. Workers with longer working experience show a higher incidence of this condition than those whose employment has been of shorter duration.

Radiographic examination indispensable to diagnosis of silicosis should be effected with the best apparatus providing technically perfect plates. Especially useful is long-distance radiography, known as teleradiography (6 ft. or more). The latter method of examination when properly carried out often shows details impossible to obtain with shorter distances. Stereoscopic examination provides highly interesting findings.

As in all diseases, diagnosis is subject to individual variations. For this reason it is absolutely indispensable to take into consideration every element furnished by the five types of examination referred to, since any one of these is in itself insufficient for assuring diagnosis of silicosis. Diagnosis of pure silicosis¹ may be made when a worker who has been exposed for upwards of a year to continuous inhalation of

¹ After having given an excellent clinical description of "fibroid phthisis" the Report of the English Departmental Committee on Compensation for Industrial Diseases (1907) affirms that this disease "presents a well-marked difference from pulmonary tuberculosis and even if the disease becomes complicated with tubercle yet the rate of progress may be determined rather by the character of the primary than of the secondary disease, though usually the supervention of tubercle hastens the sufferer into a more rapid consumption". The Report refers to the "want of parallel between the symptoms and the signs of the fibroid phthisis. Diagnosis of mixed cases, unless the infection by tubercle be very early and predominant, may present no little difficulty even to an expert who has before him the history of the individual, for the long period of chronic change even in comparatively advanced stages still may present the signs and symptoms of slow obliteration rather than of ulceration of the lungs."

silica dust shows, after careful examination of the findings as regards diaphragm and heart, breathlessness while at rest or on effort without any other clinical explanation (tuberculosis, cardiopathy) except possibly a slight apical injury. It would, however, be prudent to refrain from pronouncing a definite diagnosis of silicosis up till the point at which small mottling appears together with marked dyspnoea and the individual can no longer breathe deeply nor retain his breath for any time.

Poverty of clinical symptoms in the presence of a radiographic picture indicating grave conditions is of importance.

Radiographic findings should always be interpreted in the light of anatomical, physiological and pathological knowledge of the lungs and deductions should be made in accordance with pathological data.

The radiographic findings typical of silicosis may be simulated by other disease conditions, at the first stage by passive congestion due to cardiac trouble, to acute or chronic injury of the respiratory passages (bronchial catarrh, irritation by certain gases) and to a certain extent by cancer of the lung which is rarely primary and in general secondary to cancer of another organ. Yet clinical examination, and especially the case history, will readily enable the exclusion of such hypothesis to be made. It should be added that periodical clinical and radiological examination and frequent examination of the sputum may be of assistance to the medical man in diagnosing difficult cases, more especially when these are complicated by tuberculosis. It must be remembered that the tuberculin test and the rate of sedimentation of the red corpuscles are not always helpful in diagnosis.

When these tests are negative they are a strong argument against the presence of tuberculosis; but positive findings in either one or both of these tests do not *per se* indicate the presence of tuberculosis.

Diagnosis of "pure tuberculosis", without silicosis or "silico-tuberculosis" amongst workers exposed to dust is usually possible, being based on : general early symptoms, early occurrence of unilateral, modification of the percussion sound; on sounding, signs of a general apical injury which is chiefly unilateral; and radiologically, absence of small mottling equally distributed throughout the two lungs. Nevertheless, bilateral fibrous tuberculosis amongst old workers

may develop with clinical and radiological changes similar to silicosis of the second or third stage or to tuberculo-silicosis.

As regards differential diagnosis as between the other forms of pneumoconiosis, it should be ascertained whether the patients have been exposed to inhalation of dust in quantities reasonably proportionate to the results of the clinical and radiographic findings.

Black pigmentation in itself does not give radiographic shadows. These are produced by thick fibrous areas in the lung. Anthracotic fibrosis of slow development is clearly distinguished from silicosis, being more persistent and of more rapid evolution. Radiologically, it is almost impossible to distinguish between them, and anthracotic fibrosis might be considered as a variety of silicosis (Courtois).

The industrial history of the patient will provide information as to the nature of the dust inhaled and it is hardly necessary here to expatiate on the differential diagnosis between injuries produced by mixed dusts or asbestos dust. It may be stated in general that in such cases there should be applied, *mutatis mutandis*, the same criteria as for silicosis.

Diagnosis of serious cases is certainly difficult, especially in the presence of tuberculosis. Medical authorities are of opinion that diagnosis of serious silicosis may be pronounced when both lungs contain limited areas of large mottling or marked formation of mottling of average dimension but generalised. Clinically, there should be marked dyspnoea (breathlessness on effort, at work) with obvious diminution of working capacity, rigidity of the chest, important reduction of vital capacity, accentuation of breathlessness after mounting stairs or flexion of the knees, symptoms of serious injury.

Though generalised, small mottling on the radiographic plate without dyspnoea or other clinical phenomena cannot be said to represent a serious case, the prognosis is nevertheless unfavourable.

From the radiographic point of view, generalised mottling of the two lungs may be caused by the following: tuberculosis (miliary); syphilis with very small gummata; leucæmia (miliary foci); septicæmia (purulent foci); obliterating bronchiolitis; Boeck's sarcoid (tumours of the connective tissue); processes resembling granulomata; miliary carcinomatosis; lymphosarcomata. An experienced medical man is able to eliminate

rapidly by special research syphilis leucæmia, septicæmia, obliterating bronchiolitis, sarcoid and granulomata.

Lympho-sarcoma is of very rare occurrence. Miliary carcinomatosis does not in general show mottling as in silicosis and tuberculosis, but fine reticulated areas. Choice of diagnosis therefore rests between silicosis and tuberculosis. Despite the fact that legislative authorities have, in order to evade disputes, solved this question by compensating tuberculosis occurring as a complication of silicosis on the same basis as serious silicosis, it is nevertheless true that at times it is necessary to attempt as far as possible to differentiate the two forms. Collis and Reichmann have indicated the clinical and radiological symptoms useful in differential diagnosis. It should be said, however, that any of these symptoms in itself is without value and may only serve as a preliminary indication in so far as the personal factor does not come into play. From the point of view of diagnosis they are even of highly variable value.

	SIMPLE SILICOSIS	PULMONARY TUBERCULOSIS
	<i>Clinical Examination</i>	
Fever	Absent	High oscillating temperature
Pulse	Normal	Rapid
Blood pressure	Raised	Not raised
Night sweats	Absent	Present
Weight	No loss	Loss
Sputum	Negative for tuberculosis	Positive for tuberculosis (not necessarily)
Dyspnœa	On exertion	Only in advanced cases
Toxæmia	Absent	Present.
	<i>Blood Count</i>	
Hæmoglobin	Normal	Decreased
Red cells	Increased	Decreased
Leucocytes	Normal (number)	Increased
Polymorphonuclear cells	Normal	Increased.
	<i>Radiographic Findings</i>	
1. Disposition of pulmonary changes in slight or serious silicosis	Symmetrical on the sagittal plan	Asymmetrical on the sagittal plan

SIMPLE SILICOSIS

PULMONARY
TUBERCULOSIS

Radiographic Findings

2. In	Average	irregular	In the apices in lineal
(a) slight silicosis	mottling in both		form directed to-
			wards the hilum
(b) serious silicosis	Large isolated nodules in the hilum, evident connection with the hilum in cone-shaped form with the point of the cone at the hilum		—
	Small root glands often invisible		In general increase in volume and readily observable
	Linear marking reaching to the diaphragm (appearance of rain)		Lacking
	Diaphragm drawn in an upward direction at several points		Flat cicatricial formations
	Pulmonary sclerosis: retraction of the chest generally bilateral and of slight extent		Where present unilateral and often of great extent
	Cavitation always present, first appearance at the serious stage		Already present at the initial stage

PROGNOSIS

Prognosis depends on several factors: the nature and concentration of the dust, the silica content, the size of the particles, the duration of working experience (which may be prolonged when other factors exercise influence on working conditions, such as medical examination on engagement and periodically thereafter, factory hygiene and special working methods), individual resistance (self-drainage of the lungs), stage at which the complications occur. Many experts are of opinion that silicosis is fatally progressive, even when the individual abandons the dangerous trade, once the inhaled silica has reached a relatively high amount. There should here be recalled the cases of miners who, having quitted their occupation to join the army and been passed as fit, were subsequently discharged suffering from serious silicosis. Nevertheless, other medical authorities consider that cases of slight silicosis may progress towards convalescence where there is good self-drainage of the lungs and the worker is withdrawn from the dusty occupation. It is held that when the general living conditions remain satisfactory clinical phenomena affecting the respiratory system are lacking. Where radiographic examinations repeated

periodically show no progress of the injury there is reason to believe that the process remains stationary or is improving. Patients in the first stage undergoing sanatorium treatment have made progress towards convalescence.

It is probable that in a large number of industries the continuation at work of a worker with simple silicosis does not lead to any greater acceleration of the disease than his removal from the environment, more particularly when one takes into account the possibility of reducing the subsistence level of the worker by the reduction of earning power almost always consequent upon removal from his trade.

The prognosis in early tuberculosis with silicosis is probably but slightly less favourable than simple tuberculosis of the same degree in the same individual would have been.

In cases at the second stage it is possible to note a certain tendency towards healing when the individual is given work in the open air and made to perform respiratory exercises, but here again an important part is obviously played by the economic and social factor.

At advanced stages pulmonary fibrosis cannot be cured and improvement in the anatomical sense is not possible. According to certain authorities it is possible to find hæmoptysis and softening of the centre of the nodules and even gangrene without intervention of tuberculosis. Prognosis should, however, always be given with reserve.

It is in general unfavourable for lesions of mixed type. Medical authorities are in agreement that prognosis in cases of infectious silicosis is much less serious than that for tuberculosis with silicosis. Such patients may live for a number of years in a state of relative health until active tuberculosis breaks out.

Prognosis in cases of silicosis with closed tuberculosis is always serious and worse when the tubercular infection develops in the initial stages of silicosis and in the case of young rather than older patients.

MEDICO-LEGAL ASPECTS

Although the clinical and radiographic picture of silicosis is based on radiographs made thrice in the ten-year period furnished by tens of thousands of observations verified by hundreds of autopsies, it must nevertheless be admitted that in special cases it is usual to encounter obstacles to diagnosis. These difficulties have not prevented legislative authorities¹ from

¹ "We hold the opinion upon the evidence we have discussed that fibroid phthisis is a specific and sufficiently distinguishable trade disease affecting industries which we have named and we consider that, on the principles of the Workmen's Compensation Act, employers might properly be required to pay compensation to their workpeople who contract it. . ." (Report of the English Departmental Committee on Occupational Diseases, 1907, p. 15).

"There can be no question of the fact that the time will come when it is necessary to extend to pneumoconioses of exclusively occupational origin application of the Act dealing with compensation for occupational

granting compensation for silicosis or amending measures already adopted (Great Britain, Western Australia, etc.).

Under other legislation (Germany, for instance) only serious forms of silicosis are compensated (in practice it is, however, not always easy to discover and estimate the working incapacity of individuals who for long periods only show subjective derangements despite the fact that radiographic findings point to serious silicosis. Inversely, cases of slight gravity may represent a limitation of physiological, respiratory, and cardiac activity such that earning capacity may be greatly restricted. In general, cases indicated as serious radiographically are also serious from the clinical point of view and therefore come within the Act on compensation.

Confronted, however, with the difficulty of clearly distinguishing the different stages of silicosis when legislation only provides compensation for the third or "serious" stage, certain authors have proposed reducing classification of cases simply to "slight" and "serious", considering that the terminology employed for defining the second or intermediate stage : "marked or important changes" or "average gravity" are to be avoided. The group labelled "slight" would merely be defined with a view to its separation from that of serious cases; where the other cases belong to the first or second stages but are not accompanied by functional disturbances or by clinical symptoms involving perceptible reduction of earning capacity they do not satisfy the conditions required for obtaining compensation.

Compensation legislation, the object of which is principally prophylactic, should make allowance for allocation of transition benefits (*rentes de passage, Uebergangsrente*) to those workers affected with slight silicosis in order that they may enter a less dangerous occupation. The medical expert whose task it is to

disease, but is it possible to include in this new Act tuberculosis the origin if which it is hardly ever possible to determine with absolute certitude ?

"The reply of the Hygiene Committee is absolutely clear and not the slightest indecision exists in regard to the matter.

"According to the general report of Mr. Leclerc, of Pulligny (1903), 'pneumoconiosis presents the character of a disease specific to certain industries . . . in which industries the chance of tubercular infection is such that tuberculosis must equally be considered as of occupational origin'" (FRANCE: Discussion on Mr. J. L. BRETON'S Motion, in *Chambre des Députés*, IX Legisl., 1907, No. 325, Annexe XIV, p. 266.)

estimate the subjective symptoms and their influence on earning capacity, well aware that pathological findings are not always *pari passu* with *clinical* symptoms, should consider each particular case in the light of the laws of pathology, especially where radiography reveals serious silicosis. The problem is all the more important since objective symptoms are generally of later appearance than in cases of tuberculosis. When bronchial phenomena, even if they are slight, dominate the picture and do not point to pure silicosis, the question is not difficult to solve. The problem is more complex when, according to the patient's statement, there is dyspnoea during work and chest retraction. The medical man must then call into play objective methods calculated to discover reduction or considerable involvement of the respiratory function. It is true that in the body vicarious functioning of other organs still capable of functional activity is of great importance. Yet where a large area of the lungs has reached the limit of functional resistance, the working capacity is seriously threatened. It is on this account that increasing weight has been attached to the opinion that silicosis must be considered serious where the pulmonary function is definitely and obviously attacked in the absence of other causes and even should the radiological image not appear to confirm the existence of serious injury.

Naturally the medical man must eliminate intervention of any concomitant disease (emphysema, bronchial catarrh, heart disease, kidney trouble, etc.) which may in the case of older individuals maintain a pathological condition likely to exert at times serious influence on the working capacity.

Slight silicosis is not as a rule accompanied by important functional or anatomic complication of respiration or circulation. Hypertrophy or dilatation of the right heart only occur as a rule at a later stage. There may, however, occur border cases where the experienced medical expert alone is in a position to give an opinion based on the findings and on accurate appreciation of the existing phenomena.

As regards tuberculosis the presence or absence in the inhaled dust of substances (coal, alkalis, etc.) other than silica may, as has already been seen, modify the development of the pulmonary lesion. There does not, however, exist any justification for the statement that all cases of slight or average silicosis hinders diffusion of tuberculosis.

At times the medical expert is asked for his opinion as to the time at which silicosis probably set in or became aggravated. This important question, to which it is impossible to furnish a reply, in view of the fact that knowledge as to the evolution and even the outbreak of serious phenomena revealed on medical examination, is still far from complete. In fact, how many cases show serious development in the lapse of a few months only and how many others only reach this stage of development after a few years? It has also been possible in the absence of tuberculosis to note periods of latency even in very serious cases. Recent observations (1932) confirm serious development of the fibroid process even several years after withdrawal from work, a phenomenon which is of great importance from the medico-legal point of view. This period of latency is said to be even longer than has been imagined. The medical expert must therefore take into account former occupation (heavy and trying work) to which the patient may have been subjected for several years in contact with siliceous dust and bring this data into correlation with the clinical and radiological findings.

Just as alcohol may not produce cirrhosis of the liver, and lead in small doses chronic nephritis, until several years have elapsed, so may siliceous dust require some years before it produces the lesions characteristic of it. It is difficult, if not impossible, to establish what this latent period is. Cases have been reported in which a number of years have elapsed between a short period of exposure and the development of silicosis. As much as ten and twenty-three year periods have been reported but one may seriously doubt the complete correctness of these observations. It is more probable that the period between exposure and the development of the disease to the stage when it can be diagnosed by proper methods is very much shorter — probably not exceeding five years. This applies, of course, to simple silicosis. In silicosis with tuberculosis, the development of tuberculosis as a recognisable entity may occur at any time during the life of the patient.

Radiology constitutes a valuable aid to diagnosis, but it is of no help in estimation of the degree of incapacity. Mention may here be confined to insisting once more on the necessity for arriving at an objective opinion by utilising in conjunction the data furnished by all types of examinations referred to (see pp. 236-237). It is difficult to express in figures the degree of

incapacity for work. As is proved in the case of accidents it is practice alone which supplies the medical man with the elements necessary for effecting this decision. In general, incapacity in a grave case of silicosis is never less than 50 per cent., and experience will enable it to be graded between 50 and 100 per cent. An estimation of reduction of working capacity based on the radiological findings is said to give the following results according to Czarnecki : first stage 0 to 20 per cent. ; second, 2 to 40 per cent. ; third, 40 to 60 per cent. An infection engrafted on the disease or the revival of pre-existent tuberculosis renders incapacity more serious and of longer duration. The estimation of the progress, arrest or healing of the lesions is identical to that in the case of silicosis but it cannot be made except after control by several clinical and radiographical examinations made at short intervals. Infiltrations become smaller and less dense, being more clearly outlined, with a tendency to be displaced towards the apices presenting a closer network indicative of healing ; softening, extension and the presence of diffuse linear markings going in the direction of the hilum, and thickening of the root glands indicate, on the other hand, progress of the disease.

COST OF COMPENSATION

The statistical returns available dealing with the cost of silicosis are not very numerous. They refer for the most part to South Africa, where compensation is only granted in the gold mines. Details as to cost may be found in the Report of the Johannesburg Conference published by the Office¹. In Germany data on compensation for silicosis cannot be obtained separate from that dealing with occupational diseases in general (see p. 47). The following tables give the figures concerning compensation for silicosis in New South Wales and detailed data furnished by Great Britain.

¹ INTERNATIONAL LABOUR OFFICE: *Silicosis, Records of the International Conference held at Johannesburg, 13-27 August 1930*. Studies and Reports, Series F (Industrial Hygiene), No. 13. Geneva, 1930.

Australia, New South Wales, County of Cumberland

ADMINISTRATION OF THE WORKMEN'S COMPENSATION (SILICOSIS) SCHEME OF 1927 : CASES COMPENSATED FROM 16 SEPTEMBER 1927 (DATE OF APPLICATION OF THE ACT) TO 30 JUNE 1932

	Compensation		Medical examination				
	Num- ber of applic- ations	Compens- ation awards	Workers suspended		Workers not suspended		Total of Medical exami- nations
			On initial examination	As suffering to a dangerous degree from a disease covered by the scheme	Not suffering to a dangerous degree	Not suffer- ing from a disease cov- ered by the scheme or cases not fi- nally settled	
Stonemasons	90	52 (7)	6	44	32	262	344
Quarrymen	48	27 (2)	11	26	9	334	380
Rockchoppers and sewer miners	149	61 (9)	106	58	48	1,388	1,600
Workers not included under the scheme	9	1	—	—	—	—	—
Total	296	141 (18)	123	128	89	1,984	2,324

Figures in brackets indicate fatal cases

EXPENDITURE INCURRED BY THE JOINT COMMITTEE UNDER VARIOUS HEADS SINCE THE COMMENCEMENT OF THE SCHEME TO 30 JUNE 1932 :

	1928 £	1929 £	1930 £	1931 £	1932 £
Compensation	1,669	8,279	11,815	12,870	12,842
Medical expenses (salaries, travelling, expenses of workmen, X-rays, etc.)	447	2,779	2,772	568	582

Great Britain

SILICOSIS : NUMBER OF CASES IN WHICH COMPENSATION HAS BEEN PAID

Year	Refractories industries		Sandstone industry		Earthenware and china	
	New disable- ment	Fatal	New disable- ment	Fatal	New disable- ment	Fatal
1931	11	14	82	21	91	37
1930	22	12	69	13	98	34
1929	17	11	3 ¹	2	47	16
	50	37	154	36	236	87

[This table is continued on page 248.]

¹ The Sandstone Industry Scheme came into force on 1 April 1929.

SILICOSIS : NUMBER OF CASES COMPENSATED.- *contd.*

	Metal Industries ¹		Mines other than ganister or sandstone		Building industry		Miscellaneous		Total	
	New disablement	Fatal	New disablement	Fatal	New disablement	Fatal	New disablement	Fatal	New disablement	Fatal
1931	15	19	43	17	13	4	28	15	283	127
1930	15	13	22	8	7	1	17	9	250	90
1929			94 ²	22					114	35
	—	—	—	—	—	—	—	—	647	252

¹ The metal industries include metal grinding, sand-blasting and steel fettling.

² The Various Industries Scheme, which covers most of these industries, only came into force on 1 February 1929. The Metal Grinding Scheme has, however, been in force since July 1927. Except as regards china and earthenware, separate figures are not available for 1929.

COST OF CASES COMPENSATED, 1926-1929
Refractories Industries

Year	Disablement				Fatal cases		Total	
	New cases		Cases continued from previous years					
	Number	£	Number	£	Number	£	Number	£
1926	55	1,474	194	8,299	5	957	249	10,730
1927	35	1,139	234	10,136	19	3,245	269	14,520
1928	37	862	230	11,490	17	3,019	267	15,371
1929	7	— ¹	241	— ¹	11	1,775	258	13,911

Metal Grinding (Scheme dated 30 April 1927, applied from 1 July 1927)

1927 July-Dec.	2	55.5	—	—	—	—	2	55.5
1928	20	989.0	—	—	2	932	4	1,921.0

Metal Grinding (Scheme dated 30 April 1927, applied from 1 July 1927)

1927 July-Dec.	2	55.5	—	—	—	—	2	55.5
1928	20	989.0	—	—	2	932	4	1,921.0

¹ No separate figures for 1929; the total for all cases of disablement (continued and new) is £12,136.

COST OF CASES COMPENSATED, 1930 AND 1931

	Silicosis								Asbestosis
	Refrac- tories industries	Vario- us indus- tries	Pottery industry	Grinding of metals and various industries					
				Metal	Mines ¹	Con- struction	Various	Total	
1	2	3	4	5	6	7	8	9	10
Fatal cases:									
1930	1,552	3,300	12,284	3,062	2,417	303	2,036	24,954	—
1931	1,496	5,580	8,830	6,534	5,003	1,146	3,998	32,587	—
Disablement:									
Total benefits:									
1930	£12,015	2,281	8,008	22,270	2,198	361	1,058	28,281	36
1931	£12,132	5,228	22,940	1,987	3,942	2,049	2,763	51,041	—
Continued from previous years:									
1930	247	3	36	20	11	1	4	322	—
1931	256	56	107	25	18	6	11	479	—

¹ Other than those included in columns 2 and 3.

The Silicosis Medical Board in Great Britain consists of a number of medical men appointed by the Secretary of State for the Home Department under the powers conferred on him by section 47 of the Workmen's Compensation Act 1925. The members of the Board are duly qualified medical practitioners having special knowledge and experience in the diagnosis of pulmonary disease, and they devote their whole time to the work of the Board. At present there are nine members of the Board, one of whom is Chief Medical Officer, who has his headquarters at Sheffield, Yorkshire, which is a convenient centre for those industries with which the Board is concerned.

The remaining eight members are divided into four panels, each with two members, one of whom is designated "senior member".

The panels are located respectively in Sheffield, Manchester, Stoke-on-Trent and Bristol, and to each is assigned a district within which the panel carries out the duties of the Board.

The duties of the Board comprise the examination of workmen and the granting of certificates, as required under the provisions of the Compensation Schemes made in pursuance of the Workmen's Compensation Acts 1925 to 1930. The examinations include (1) initial examinations of persons entering one of the industries or processes scheduled for this purpose; (2) periodical examinations of workmen employed in certain industries and processes; (3) examinations of workmen who have claimed compensation; (4) post-mortem examinations in which a claim for compensation is made by or on behalf of the dependants of a deceased workman.

The amount of work which is performed by the Board may be gathered from the examinations made, claims received and cases dealt with during the year ended 31 May 1933:

Examinations: Initial 539; Periodical 7,000;

Re-examinations 71;

Claims: Fatal cases 209; Disablement and suspensions 771.

The expenses of the Medical Board including salaries and travelling expenses of the members, clerical assistance, office and other administration expenses, are met out of a General Medical Expenses Fund established under the Medical Arrangements Scheme 1931. This Fund is maintained by fees payable by employers and workmen together with a contribution from the Exchequer.

* * *

The medical members of the Correspondence Committee on Industrial Hygiene, invited to meet in Geneva in July 1933 by the International Labour Office, in order to discuss the question of the diseases to be added to the Schedule of the 1925 Convention — after deliberation — adopted the following draft conclusions relative to silicosis:

1. Inhalation of free silica may lead to a morbid condition known as pulmonary silicosis.

2. Simple silicosis or silicosis associated with pulmonary tuberculosis is an occupational disease entitling the victim to compensation in accordance with the principles of national legislation for accidents or other occupational diseases.

3. Tuberculosis is frequently associated with silicosis. In view of the difficulty, or even impossibility of distinguishing in each particular case, what part of the incapacity is attributable to silicosis or tuberculosis, where the diseases coexist, the incapacity resulting from the combined operation of both should be compensated as if it were a case of simple silicosis.

4. For the purpose of an international convention it is considered impracticable to enumerate industries or processes in which there is a risk of contracting silicosis. The convention should confine itself to a statement of the principle that all cases of silicosis, whether associated with tuberculosis or not, should be compensatable, leaving to national legislation to fix the details of application of this principle. It is therefore suggested that the following be inserted in the draft schedule:

List of diseases and forms of poisoning

Silicosis with or without tuberculosis.

List of industries or occupations

Any industry or process involving exposure to the risk of silicosis as defined by the competent national authority.

5. Compensation for silicosis is organised either by extension of the Workman's Compensation Act, or that for occupational diseases, or by special law, or by the creation of a special fund for compensation based on contributions by those industries involving the risk of silicosis. Competent national authorities may be allowed to choose which of these systems is best adapted to their scheme of legislation.

6. Experience proves that for the purposes of compensation it is essential to entrust the diagnosis and certification of silicosis only to medical men specially qualified for this work who should be provided with the necessary equipment, especially with facilities for adequate radiological examination.

There should be organised by each national authority a central controlling body whose duty it should be to ensure that adequate facilities are provided for the carrying out of examinations, for the free interchange of experience between the medical examiners and for co-ordinating this experience with scientific research.

7. Compensation for industrial diseases should not be considered apart from prophylactic measures.

The most important of these is the prevention of dust. Consideration should also be given to the importance of preliminary and periodical examination of employees in at least the occupations involving practically continuous exposure to free silica dust.

8. As regards many pneumoconioses, in consideration of the insufficient knowledge at present available, it would be advisable that in each country research in regard to these diseases should be instituted, and the results thereof communicated to the Office.

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FOURTH PART

SILICOSIS LEGISLATION

This part of the report is restricted to analysing in detail only certain special Acts issued in the following countries: Australia (New South Wales, Western Australia), Great Britain, New Zealand, South Africa.

For other countries in which silicosis is compensated under the Compensation Acts on occupational disease see schedules and the analyses¹. (Argentina, Australia (Queensland, Tasmania, Northern Territory), Bolivia, Brazil, Bulgaria, Canada (Alberta, Ontario, Quebec, Saskatchewan), Czechoslovakia, Chile, Denmark, Germany, Great Britain, Japan, Mexico, Sweden, Switzerland, U.S.S.R., United States.)

AUSTRALIA

New South Wales

COUNTY OF CUMBERLAND

Sandstone Industry

An Act to provide for the payment of compensation in the case of workmen who suffer death or disablement or are suspended from employment owing to the disease known as fibroid phthisis or silicosis of the lungs, or owing to other diseases of the pulmonary or respiratory organs caused by exposure to silica or other dust; to amend the Workmen's Compensation Act, 1916; and for purposes consequent thereon or incidental thereto. (11 Geo. V, No. 13. Assented to 19 November 1920.) Workmen's Compensation (Silicosis) Act, 1920. (*L.S.*, 1926, Austral. 5.)

An Act to amend the law relating to Workmen's Compensation... to amend the Workmen's Compensation (Silicosis) Act, 1920; and certain other Acts; and for purposes connected therewith. (16 Geo. V, No. 15. Assented to 18 March 1926.) (Workers' Compensation Act, 1926.) (*L.S.*, 1926, Austral. 5.)

Workmen's Compensation (Silicosis) Scheme No. 1, 1927, under the Workmen's Compensation (Silicosis) Act, 1920 (Act No. 13, 1920), as amended by the Workers' Compensation Act, 1926 (Act No. 15, 1926), dated 16 September 1927 and published in the *Government Gazette*, No. 131, 16 September 1927.

Variations of the Workmen's Compensation (Silicosis) Scheme No. 1, 1927, dated 5 June 1929 and published in the *Government Gazette*, No. 73, 7 June 1929.

¹ Part II, p. 57.

Variations of the Workmen's Compensation (Silicosis) Scheme No. 1, 1927, dated 12 March 1930 and published in the *Government Gazette*, No. 30, 14 March 1930.

Variations of the Workmen's Compensation (Silicosis) Scheme, No. 1, 1927, dated 20 February 1933 and published in the *Government Gazette*, No. 30, 24 February 1933.

The Workmen's Compensation (Silicosis) Act, 1920, gave power to the Minister to make a scheme for the payment of compensation for workmen in any specified industry or group of industries or processes who died or were disabled and are suspended from employment owing to fibroid phthisis or silicosis of the lungs or other diseases of the respiratory organs caused by exposure to silica or other dust. No such scheme had been gazetted when this Act was amended by the Workmen's Compensation Act, 1926, No. 15, and it now applies only to diseases caused by silica dust which are not provided for in the general compensation Act for the State. Only one scheme has been made under the Act, the Workmen's Compensation Silicosis Scheme No. 1, 1927, and it applies to the County of Cumberland, and affects metropolitan workmen employed working in sandstone as stonemasons, quarrymen, rock-choppers, or sewer miners. Minor amendments of the scheme have been made.

The Act of 1920 amended by the Act of 1926, adopting the principle of compensation for injuries due to silica dust, lays down the lines on which the system of compensation is to be established as well as the rules of procedure relative to administration of the Act. All the details are found in the 1927 scheme.

Compensation is provided for fibroid phthisis or silicosis of the lungs accompanied or not by pulmonary tuberculosis or for any other disease of the lungs and respiratory passages caused by silica dust. The system of compensation in the 1927 scheme only covers the following workmen employed in the industry of working sandstone in the county of Cumberland:

Stone masons.

Quarrymen: means persons employed in excavating sandstone in or about sandstone quarries as quarrymen, spawlers, hammer drill and jumper men and/or drilling and cutting machine operators.

Rock choppers: means persons employed in excavating sandstone by means of guttering and gadding or guttering and blasting or chopping sandstone.

Sewer-miners: means persons employed — (a) to sink shafts in sandstone; (b) to drive tunnels in sandstone; (c) to excavate trenches in sandstone and including persons handling sandstone in the immediate vicinity of sewer-miners excavating sandstone in shafts, tunnels and/or drives.

Nevertheless the scheme does not cover persons whose remuneration exceeds £525 per year or a person whose employment is casual and who is employed otherwise than for the operation of the employer's trade or business, or a member of the employer's family dwelling in his house.

Compensation is accorded on the presentation of an adequate medical certificate proving death, total incapacity or temporary suspension from employment on account of the diseases covered when contracted in the above processes.

Suspension from work is authorised when a workman without suffering from total incapacity is affected by one of the diseases covered in the scheme to such a degree as to make it dangerous for him to continue work in the industry on one of the processes in question.

Compensation is only accorded under the following conditions: *Duration* of employment in one of the processes above referred to being considered as sufficient by the medical authority; *residence* in the country during five years with employment in the said industry for not less than 300 days during such period of 5 years immediately preceding the date of death or incapacity, or residence for not less than five years out of the seven immediately preceding the date of death or incapacity with not less than 500 days of employment during such period of seven years; *observation* of the regulations imposed by the scheme (periodical or other medical examinations; declaration relative to all employment in industries with risk of silicosis; abstention from all work on processes covered subsequent to suspension from work).

Any workman or dependants receiving compensation under the scheme shall not be entitled to receive at the same time compensation under any other scheme made in pursuance of the Workmen's Compensation (Silicosis) Act or under any Act in force in New South Wales for the time, relating to compensation to workers in respect of injuries, disablement or industrial disease.

Certificate and assessment of incapacity are effected by the medical authority, the appropriate medical certificate being accorded under the following conditions:

(a) in the case of *death* a certificate shall be granted showing the cause of death subsequent to post-mortem examination,

provided that where the deceased was in receipt of weekly payments under this scheme, but only in such cases, the medical authority may, if satisfied that a post-mortem examination is unnecessary, grant a certificate without such examination.

In the case of claims for allowance for *total or partial incapacity* a certificate must specify the degree thereof;

(b) any workmen suspended from work may within six months of the date of such suspension apply to the joint committee for a warrant authorising him to be re-examined by the medical authority. Further, every worker receiving weekly benefits under the scheme shall be re-examined at such intervals as may be specified in the certificate by the medical authority, who shall issue a fresh certificate confirming or amending the previous certificate;

(c) incapacity may be certified during the medical examinations required on engagement or periodically thereafter. Any workman newly engaged shall, unless he had already been examined under this scheme within the preceding twelve months, submit himself for examination before the end of the first month of his employment or, in exceptional circumstances, within such extended period as the joint committee may authorise. If, on such examination, the worker is found to be unsuitable for work in the industry by reason of his failure to satisfy the requirements with respect to physique prescribed¹ for work in the processes covered, the medical authority shall suspend the workman from further employment and shall certify accordingly. Such a workman cannot seek re-engagement in the industry covered nor be accepted for work on one of the processes covered, by an employer. Provided that if any workman who has not been suspended from work as a result of periodical examination should leave any occupation under the scheme, he may at any time within ten years of leaving such occupation return to any industry under the scheme and shall be exempt from the provisions respecting the initial examination.

Any workman to whom the scheme applies shall be examined by the medical authority at the intervals directed by the joint committee.

¹ The chest must be at least of average development with satisfactory expansion and there must be no deformity or obstruction of the upper air passages or elsewhere which interferes with respiration. There must be no signs of present or past disease of the lungs or heart and no signs of present or past tuberculosis of any region.

A workman found unfit as a result of one or other of the diseases covered is suspended from work and receives a certificate specifying the extent of his incapacity. Under these conditions the workman is bound by the obligations relative to suspension from work, provided that no workman shall be suspended for simple silicosis. Where the workman engaged in one of the processes covered by the scheme has not been examined under the said scheme on entering the occupation or periodically thereafter he must submit to medical examination before leaving the industry or within six months thereafter and a record of his physical condition shall be preserved by the medical authority.

Any workman discharged or temporarily suspended by his employer, or who has voluntarily left the industry after the commencement of this scheme and who has not been examined under this scheme within the previous six months may apply for a warrant authorising him to be examined by the medical authority if he claims to be suffering from one of the diseases covered to such a degree as to make it dangerous for him to continue work in the industry.

Any certificate given by the medical authority shall be conclusive evidence of the condition of the worker.

Benefits are provided in case of death, total incapacity and suspension from work ¹.

In case of *death* the rate of indemnity for the dependants shall be determined by the joint committee in accordance with the scale described by the Workmen's Compensation Act of 1916. Provided that the workman leaves no dependants, the compensation payable under the scheme shall be limited to the payment of reasonable medical and burial expenses.

In case of *total disablement* the compensation shall be payable from the date certified by the medical authority as the date on which the disablement commenced or if the medical authority is unable to certify that date, then from the date on which the certificate is given.

In the case of *suspension from employment*, if the workman is unable immediately to obtain other suitable employment at an equal or greater rate of remuneration, he shall be entitled,

¹ The Silicosis Act provides for payment in case of death of £500 sterling, in case of incapacity £750 sterling, but no allowance is made for dependants save unexpended corpus.

according as to whether his general physical capacity is impaired or not, to a disablement or a transitional allowance.

(a) The *disablement allowance* granted in cases of reduced working capacity consists of a weekly payment, for a period of two weeks from the date of suspension, equal to the full amount of his wages. From the third week, and while impairment continues, the workmen shall be entitled to a weekly payment as for partial incapacity fixed in accordance with the Workmen's Compensation Act of 1916 as reproduced in the schedule to the scheme. (b) The *transitional allowance*, where there is no impairment of general physical capacity for employment, consists of a weekly payment equal to the full amount of his wages for a period of two weeks and thereafter for a period or periods not exceeding twenty-six weeks in all of a weekly sum equal to sixty-six and two-thirds per cent. of his average weekly earnings, computed in accordance with a scale set out in the schedule to this scheme and not exceeding £3 per week.

If, on suspension, the workman is compelled, in order to obtain other suitable employment, to move from the district, he shall be entitled to receive such sum for removal expenses as may be awarded by the joint committee.

The scheme further provides for *payment of travelling or other expenses* incurred by a workman in submitting himself for examination by the medical authority.

Amongst other financial provisions the scheme also provides for redemption in part of the weekly payments by payment of a lump sum.

Procedure is, in principle, the same as that in the Workmen's Compensation Act (Silicosis), 1920 (in virtue of which the scheme was issued), the Act in question being construed with the Workmen's Compensation Act, 1916.

In case of *death*, dependants shall apply to the medical authority who shall arrange for a post-mortem examination with a view to providing the certificate necessary.

In case of *total disablement*, the workman may apply to the joint committee for a warrant authorising him to be examined by the medical authority. In case of *partial disablement*, apart from the procedure instituted in regard to periodical medical examination, the same application may be made by any worker discharged or temporarily suspended who has voluntarily left the industry. Any workman suspended under the scheme may

within six months of the date of such suspension apply to the joint committee for re-examination by the medical authority. The medical authority shall forward every certificate to the secretary of the joint committee and shall also notify the secretary of the joint committee of any refusal to issue a certificate.

The joint committee shall keep a record in a form approved by the Workmen's Compensation Commission of New South Wales of every examination made and certificate issued under this scheme.

In order to facilitate procedure every workman shall be supplied by the joint committee with a register in which shall be entered: (1) the date of commencement of his employment in an industry covered, the name and address of the employer, the nature of the employment, and the date of leaving; (2) the same information regarding any later employment; (3) the date of any examination by the medical authority in pursuance of the scheme.

It shall be the duty of every workman to furnish true information to the joint committee and medical authority as to his employment in any industry involving exposure to silica dust and covered by the scheme. Any weekly payment shall, if the medical authority alters the previous certificate, and may, at any time, on the application made on behalf of the fund or the workman, be reviewed by the joint committee, and on such review may be ended, continued, diminished, or increased.

If any question arises in regard to the application of the scheme, it shall be decided by the joint committee.

The scheme provides for the creation of a *Joint Compensation Fund* to be maintained by subscriptions paid by employers in the industry, and such subsidies as may from time to time be provided by Parliament.

It shall be the duty of the joint committee, subject to and in compliance with any directions given by the Minister, to fix, levy and enforce all such subscriptions as are necessary; the Minister may on like recommendation require the joint committee to adopt different rates of levy for different risks. Every employer affected by this scheme shall keep a correct record of wages or other remuneration paid and maintain such information at the disposal of the joint committee. At present (1932) the contributions are fixed at 3 per cent. of the wages paid to the workers.

Individual responsibility on the part of the employers is replaced by collective responsibility met by the establishment of a compensation fund to be administered according to the Act, either through a mutual trade insurance company or society of employers, or in such other manner as may be provided by the scheme. At present (1932) the fund is administered by the joint committee. Its essential object is the payment of all compensation and such other expenses as may be prescribed in or arise under the scheme (expenses of the joint committee, medical authority, etc.).

"The Workers' Compensation Commission of New South Wales" administers the provisions of the principal Act. As regards more especially the compensation scheme, the Commission may from time to time appoint legally qualified medical practitioners to undertake the duties of medical authority for the purposes of the scheme and fix the rate of travelling or other expenses incurred by a workman in submitting himself for medical examination, and approves the form of the record kept by the Joint Committee of every examination made and certificate issued under the scheme.

The administration of compensation is entrusted to the joint committee, comprising one representative of the Crown, one representative of other employers affected by the scheme, and two representatives of employees to whom the scheme applies, with an independent presiding officer. Other members of the joint committee shall be appointed by the Minister, shall hold office for three years, and shall be eligible for reappointment at the expiry of any term of office.

The joint committee deals with all questions raised by the application of the system, fixes, levies, and enforces all such subscriptions necessary to enable the fund to meet its liabilities under the scheme, makes awards of compensation and fixes the amount and payment thereof. The determination by the joint committee of any question assigned to it shall be final.

As regards procedure in administration of the scheme, the medical certificate must be given by a medical authority constituted by two or more legally qualified medical practitioners. Where a medical authority has been employed as a medical practitioner in connection with any claim for compensation under this scheme by or on behalf of a workman, he shall not act as a medical authority in connection with such claim.

“Medical authority” means a legally qualified medical practitioner appointed as a medical officer, a medical board or a medical advisory body under the scheme.

Appointments are made by the Workers’ Compensation Commission.

BROKEN HILL

Metalliferous Mines

An Act to provide for the promulgation of a scheme to procure the payment of compensation in the case of workmen certified after medical examination to be suffering from pneumoconiosis or tuberculosis and prevented from resuming employment in metalliferous mines at Broken Hill; to amend the Acts relating to Workmen’s Compensation and for purposes connected therewith. 11 Geo. V, No. 36. Assented to 31 December 1920. (Workmen’s Compensation (Broken Hill) Act, 1920.) (L.S., 1929, Austral. 9 C.)

An Act to amend the Workmen’s Compensation (Broken Hill) Act, 1920; to continue its operation beyond 30 September 1928; to provide compensation for the group of persons known as the Broken Hill “Hard Luck” cases; to provide for the promulgation of a scheme to procure the payment of compensation to certain workmen who suffer death or disablement or are suspended from employment in the Broken Hill mines, owing to pneumoconiosis or tuberculosis; and for purposes connected therewith. No. 22 of 1927. Assented to 1 March 1927. (Workmen’s Compensation (Broken Hill) (Amendment) Act, 1927.) (L.S., 1929, Austral. 9 D.)

An Act to amend the Workers’ Compensation Act, 1926 to 1927, the Workmen’s Compensation (Broken Hill) Act, 1920, the Workmen’s Compensation (Broken Hill) (Amendment) Act, 1927, and certain other Acts; and for the purposes connected therewith. 20 Geo. V, No. 36. Assented to 29 November 1929. (Workmen’s Compensation (Amendment) Act, 1929.) (L.S., 1929, Austral. 9 A.)

It should be added that compensation for certain workers at Broken Hill is granted under the following Act:

An Act to provide for compensation for certain persons out of the Fund established under the Workmen’s Compensation (Broken Hill) Act, 1920-1929; to amend that Act; to validate certain payments by the Joint Committee; and for purposes connected therewith. 20 Geo. V, No. 43. Assented to 23 December 1929. (Workmen’s Compensation (Broken Hill) (Amendment) Act, 1929.) (L.S., 1929, Austral. 9 B.)

By the Workmen’s Compensation (Broken Hill) Act, 1920-1929, provision was made for the promulgation of a scheme for the payment of compensation to workmen suffering from pneumoconiosis or tuberculosis and prevented from resuming employment in metalliferous mines at Broken Hill in the county of Yancowinna, New South Wales.

Compensation is paid to men affected by pneumoconiosis and/or tuberculosis, and in the case of a later class of employees, called for the purposes of the Act “mine employees” the diseases have to be reasonably attributable to the work in the mines at

Broken Hill. The Act applies to workers and employees in the metalliferous mines at Broken Hill situated in the county of Yancowinna in the State of New South Wales, and which are enumerated in a list provided in section 2 of the schedule to the scheme.

The Broken Hill Act (1929) covers "mine workers", "mine employees", and "hard luck cases".

"Mine workers" are men who were employed in the Broken Hill mines on 1 May 1919. As it was considered that these "mine workers" were not only affected by the dusts of Broken Hill mines but also by various other mining activities in which they had been engaged, it was arranged that they should be compensated from a fund to which the Government contributed.

"Mine employees" are men who entered the employ of the metalliferous mines of Broken Hill after 31 December 1920. As these men were subject to an initial examination (Article 9 of the Act) it was considered by the Government that if they developed dust disease of the lungs the Broken Hill mine which employed them was alone to blame. They were, therefore, to be paid by the mine owner who last employed them subject to a contribution from any other mine owner who had employed them during the previous ten years. For this class only expenses of administration and medical examination are paid out of the fund (Article 9, section 2, of the Act).

"Hard luck cases" were men in a small class who failed to satisfy requirements specifically laid down in the Act (Article 10 of the Act). A limited sum was paid to these out of the fund.

Compensation is provided in case of death or suspension from work, and benefit is paid to the claimant, or in case of death to his dependants, on production of the medical certificate delivered by the medical authority appointed under the Act, and stating that incapacity or death was due to the diseases specified in the Act. The Act likewise covers certain so-called "hard luck cases" inscribed in the schedule assented to 1 January 1927, as well as any person who was employed at the Broken Hill mines prior to 1 January 1931, and is certified by the medical authority to be suffering from pneumoconiosis and/or tuberculosis reasonably attributable to his employment in the Broken Hill mines, and who for that reason, ceased or has ceased to be so employed. No compensation shall be payable on suspension from work if the medical authority certifies that the mine

worker is capable of earning the amount declared by the statutory authority to be the living or basic wage for the locality whether within or without the State in which he resides.

Compensation is also accorded to any worker claiming benefit, and having received the requisite certificate from the medical authority, who presents himself for a medical examination in the six or twelve months following suspension from work and has made his claim for compensation within a delay of five years and under the conditions laid down in the Act.

Benefit is not accorded except where the workman has complied with all the measures imposed by the scheme (periodical or other examinations, notification of his employment in the mines, observation of any restrictions in regard to receipt of other compensation benefit, resumption of work in any mine or quarry subsequent to suspension from work, obligation to accept any employment offered for which he is certified as capable, etc.). By failure to observe these measures, a mine worker forfeits all right to compensation except in the case of a *bona fide* mistake on his part, or of causes outside his control, the decision in regard to this being left to the discretion of the Joint Committee.

Estimation of disability is effected by the medical authority which issues the requisite medical certificates subsequent to medical examination, as provided for in the Act; (a) upon claim for compensation consequent on the death of a mine worker, in which case the medical authority may proceed to effect an autopsy; in case of suspension from work in regard to which the medical authority is required to estimate the degree of general incapacity due to pneumoconiosis and/or tuberculosis; (b) in the case of a workman claiming compensation he must be re-examined every six months or at such intervals as may be specified by the medical authority. New certificates issued may confirm or modify former certificates; (c) mine workers who have not, prior to the establishment of the scheme, been examined by the medical authority shall be so examined before resuming work, and according to the state of health the medical authority may prohibit re-engagement or employment in or about any of the said mines and where re-engagement or re-employment is so prohibited the medical authority shall certify the degree of general physical incapacity, if any, for work; (d) periodical examination of workers in mines covered,

every six months or at intervals prescribed by the medical authority; (e) special medical examination in regard to "hard luck cases". Certificates granted on the occasion of such examination by the medical authority constitute final proof in regard to facts ascertained. Benefits for death or suspension from work take the form of weekly payments, the amount of which is fixed by the Joint Committee in reasonable proportion to the financial loss incurred. Nevertheless, this sum may not exceed £3 (per week) for the miner, £1 in respect of any dependent father, mother, brother or sister, and 8s. 6d. for each child under fourteen. In any case, the maximum payment for compensation to the above dependants shall not exceed £1 17s. Each widow, until re-married, is entitled to a weekly allowance of £2 10s.

During partial incapacity, the weekly payment shall in no case exceed the difference between the living or basic wage for the time being declared by the statutory authority for the locality, and the average weekly sum earned, and shall bear such relation to the amount of such difference as in the circumstances of the case may appear proper to the Joint Committee (financial situation of the claimant, etc.).

Benefits include besides the weekly allowance, the cost of such medical, surgical and hospital treatment as may, in the opinion of the Joint Committee and on the recommendation of the medical authority, reasonably be required to relieve such worker from the effects of pneumoconiosis and/or tuberculosis. The maximum payment shall in no case exceed the sum of £125. Such amount as is considered reasonable by the Joint Committee might be allowed to a beneficiary who is compelled, in order to obtain suitable employment, to remove from the county of Yancowinna. Likewise, any travelling expenses reasonably incurred by a mine worker in submitting himself for any medical examination under the scheme shall be paid from the fund.

Funeral expenses of a mine worker considered reasonable by the Joint Committee may be allowed not exceeding a total of £20.

In "hard luck cases" compensation may be granted, and in making awards in regard to these, the Joint Committee shall take into account the salary earned and other circumstances of the claimant.

The Joint Committee may, in the case of a beneficiary who undertakes in writing to leave Broken Hill, advance to him in one or more sums up to two years' compensation.

On the other hand, any beneficiary may (with the approval of the Joint Committee) agree upon a *lump sum* to be paid in full satisfaction of compensation.

In order to qualify for all benefits provided by the compensation scheme, the victim or his dependants must be in possession of a medical certificate confirming the existence of incapacity or death due to the diseases covered.

The Joint Committee shall, on application by a mine worker, issue to him a warrant authorising him to be examined by the medical authority, and upon production of such a warrant the medical authority shall examine him accordingly. A certificate shall be granted only after consideration of the case has been given by the medical authority at a meeting at which all members are present. The medical authority shall forward every certificate to the Secretary of the Joint Committee and shall also inform the Secretary of any refusal to issue a certificate. The medical authority shall keep in the prescribed form a record of every examination made and the certificates issued under this scheme.

Awards of compensation shall be made by the Joint Committee after receiving from the medical authority the certificate and all information necessary to establish the claim to compensation.

Mine owners are required to furnish the Joint Committee with full particulars of payments of compensation under the Act and mine workers to make full and complete disclosure to the Joint Committee of any earnings or income.

Every mine worker entitled to compensation shall be supplied by the Joint Committee with a register in the prescribed form in which shall be entered: the date of commencement of any employment, the name and address of the employer, the nature of the employment and the remuneration, the date of any examination by the medical authority and the result of such examination. A duplicate register shall be kept by the Joint Committee.

Any weekly payment may be reviewed and increased or diminished as the Joint Committee may decide; the award may be terminated on receipt of a medical certificate stating that the

mine worker is no longer suffering from pneumoconiosis and/or tuberculosis.

Appeal from decisions of the Joint Committee may be made to the Workers' Compensation Commission, the decision of which is final.

The pendency of an appeal shall not suspend the operation of a decision unless the Commission so directs.

No decision of the Joint Committee shall be vitiated by reason of any informality or want of form or be liable to be appealed against by any court of judicature except as provided for in the Act.

The 1920 Act provides for the establishment of a compensation fund administered by the Joint Committee and maintained as to one half by contributions of the mine owners and as to the remaining half by contributions from the Government.

The mine owners contribute: (a) one-half the amount of compensation in respect of mine workers for whom they are responsible; and (b) half of the cost of administration, in the ratio of their payments in respect of compensation.

The Joint Committee may accept in lieu of the contributions to the fund a lump sum determined by an actuary.

The cost of compensation for the "hard luck cases" shall be paid by the Joint Committee out of the fund established by the scheme.

Any mine owner failing to carry out any duties imposed on him under the Act may be directed to pay increased contribution to the Fund.

The Broken Hill Compensation Fund provides payment of compensation due to "mine workers" and "hard luck cases" and cost of administration for all three classes, half of these amounts being (as already stated) recovered from the mine owners.

For "mine employees" only compensation is recoverable from the mine owner who last employed the mine employee, but any mine owner from whom compensation is recoverable shall be entitled to contribution towards such compensation from any other owner who, during the period of ten years preceding the date of the medical certificate certifying disability, employed the mine employee to whom compensation is payable, upon a basis agreed upon by the owners. Unless and until such agreement is notified the rate of contributions shall be propor-

tionate to the number of shifts the mine employee was employed by each such owner during the said period.

The Workers' Compensation Commission for industrial accidents in New South Wales is the competent body to whom appeals may be addressed.

The *Joint Committee* is responsible for administration of the scheme. It consists of four members appointed by the Minister, two of whom are appointed by the mine owners and two by the mine workers, and an independent chairman.

The Committee administers the Compensation Fund, fixes and levies the contributions payable by the mine owners, awards compensation payments, and arranges for payment of these in accordance with recognised procedure.

The medical authority appointed to carry out medical examination of the workers consists of three medically qualified medical practitioners appointed by the Governor — one as chairman and the other two being nominated by the mine owners and mine workers respectively.

Western Australia

Act relating to miners' phthisis. No. 16 of 1923. Assented to 22 February 1923. *Miners' Phthisis Act, 1922.* (*L.S.*, 1923, Austral. 3.)

An Act to amend the *Miners' Phthisis Act, 1922.* No. 42 of 1925. 16 Geo. V, No. XLII. Assented to 31 December 1925. *Miners' Phthisis Act Amendment Act, 1925.* (*L.S.*, 1925, Austral. 10.)

Regulations dated 2 September 1925, in pursuance of the *Miners' Phthisis Act, 1922.* (*Government Gazette*, 1925, No. 38, p. 1596.)

An Act to amend the *Miners' Phthisis Act, 1922.* 20 Geo. V, No. 39. Assented to 31 December 1929. *Miners' Phthisis Act Amendment Act, 1929.* (*L.S.*, 1929, Austral. 11.)

Regulation dated 2 July 1929 in pursuance of the *Miners' Phthisis Act, 1922.* (*Government Gazette*, 1929, No. 31, p. 1623.)

Regulations dated 1 April 1930 in pursuance of the *Miners' Phthisis Act, 1922.* (*Government Gazette*, 1930, No. 16, p. 1008.)

Regulation dated 22 March 1932 in pursuance of the *Miners' Phthisis Act, 1922.* (*Government Gazette*, 1932, No. 14, p. 405.)

An Act relating to the relief of mine workers. No. 37 of 1932. Assented to 30 December 1932. *Mine Workers' Relief Act, 1932.*

Regulations under the *Mine Workers' Relief Act, 1932.* Dated 25 January 1933. (*Government Gazette*, No. 6, 1933, p. 164.)

Regulations under the *Mine Workers' Relief Act, 1932* (Erratum), dated 9 March 1933. (*Government Gazette*, No. 12, p. 375.)

The Act of 1932 relating to relief of mine workers, which came into force on 1 February 1933, supersedes the provisions of the Act of 1922 as well as the various regulations issued relative to miners' phthisis.

In regard to payment of benefits these are based on the 1932 Act and that of 1912-1924 dealing with workers' compensation¹.

Nevertheless, the 1922 Act continues to apply (and the 1932 Act is not applicable) to those miners, who, prior to the commencement of the 1932 Act, had been prohibited from employment on, in or about a mine, and were receiving, or whose dependants were receiving, compensation, under the former Act or regulations thereunder at the commencement of the 1933 Act.

The 1932 Act concerns relief for miners suffering from silicosis and tuberculosis. Two stages of pulmonary silicosis are distinguished under the Act: (a) the early stage, when it is found that definite and specific physical signs of silicosis are, or have been, present, and that capacity for work is, or has been, impaired by that disease, although not seriously and permanently; (b) the advanced stage, when it is found that definite and specific physical signs of silicosis are, or have been, present, and that capacity for work is, or has been, seriously and permanently impaired by that disease.

"Tuberculosis" within the meaning of the Act is defined as "tuberculosis of the lungs or of the respiratory organs and tuberculosis of the glands and other parts of the body, where the cause of such disease may be legitimately attributed to the nature of their employment as mine workers". For the purposes of the Act a person is deemed to be suffering from, or to have suffered from, tuberculosis when it is found (a) that such person is expectorating the tubercle bacilli; or (b) that such person has closed tuberculosis to such a degree as seriously to impair his capacity for work, and to render it advisable for the benefit of his health to prohibit him from working as a mine worker.

The Act also affords compensation to those persons who whilst employed as mine workers, or within two years after being so employed, are, or become, incapacitated or whose earning power is materially prejudiced by any disease or malady which may be legitimately attributed to the nature of their employment as mine workers, provided the disease or malady has not been contracted under circumstances which entitle the person suffering from the same to compensation under the Workers' Compensation Act.

¹ L.S., 1925, Austral. 2.

The Act operates and has effect only in those portions of the State mentioned in the Schedule appended to the Act and in such other portions of the State as the Governor may by Order-in-Council declare. Subject to this limitation, the Act covers all mine workers (as defined in the Act). Subject to the approval of the Governor in each case, the term "mine worker" also includes a person whose employment is directly or indirectly connected with the mining industry. "Mines" and "mining" have the same meaning as in the Mining Act of 1904. The term also includes a district inspector or workmen's inspector appointed under the Mines Regulation Act, 1906.

The processes covered include surface and underground work. "Underground" in relation to work or employment of a mine worker includes work or employment beneath the natural surface of the ground; and upon or about dry crushing mills; and in a sample crushing room; and in an assay office or change house; and in any tailings dump; and any other work or employment which the Governor by Order-in-Council may declare to be underground work or employment.

Benefits are granted on the basis of a medical certificate:

1. On prohibition from employment in cases of silicosis with tuberculosis or tuberculosis without silicosis; on voluntary cessation of work in cases of silicosis in the advanced stage provided that the mine worker ceases work within twelve months after the service upon him of a notice following certification of the disease.
2. When, in the case of voluntary cessation of work on account of silicosis in the early stage, the mine worker develops later tuberculosis with silicosis or silicosis in the advanced stage.
3. In the case of death of a mine worker benefit is accorded to his dependants.

Any person receiving compensation or benefit under the Act shall cease to be entitled to such compensation or benefit if and during such time as he is employed in any capacity on, in, or about a mine.

Certification of disease and determination of its extent is effected by Government medical officers and medical practitioners appointed for this purpose by the Minister.

Every mine worker covered by the Act must submit himself for examination whenever required to do so by the Minister or any medical officer or medical practitioner as above referred to. Medical examinations are effected by the medical officers and practitioners referred to above or by the Commonwealth Health Laboratory at Kalgoorlie.

It is the duty of every medical officer and medical practitioner to report to the Minister from time to time the results of the examinations effected.

There is no waiting time as benefits are payable from the day following cessation of work or the date of medical examination, as the case may be.

Compensation is payable, under the 1912-1924 Workers' Compensation Act, or from the Mine Workers' Relief Fund established under the 1932 Act in accordance with a scale fixed by the 1933 Regulations.

1. In case of prohibition from employment on account of tuberculosis and silicosis, the benefit accorded is that corresponding to total and permanent incapacity under the Workers' Compensation Act, provided that under certain circumstances the mine worker is entitled to receive the difference between this benefit and the amount which he would have earned as a mine worker; later, when his right to payment of the sum due under the Act expires, the mine worker, provided that he has continued to pay his subscriptions to the Fund, though prohibited from employment will receive the benefit provided as in Scale I (see below, page 274).

2. The mine worker suffering from silicosis in the advanced stage who voluntarily ceases work, as likewise the miner suffering from silicosis in the early stage without tuberculosis who also ceases work in accordance with the recognised procedure on being certified, within twelve months of cessation of work, as suffering from tuberculosis and silicosis or advanced silicosis, receives the benefits referred to in the foregoing paragraph 1. When certification of these diseases occurs only after a lapse of time exceeding twelve months from cessation of work, the miner and his dependants receive the benefits provided in the following paragraph 3.

3. In case of prohibition from employment for tuberculosis without silicosis, provided that the miner has been employed

on underground work in a mine covered by the Act; that the presence of tuberculosis without silicosis has been certified in course of the employment in question, or within twelve months after prohibition from employment, and that previously the miner had been certified by the Commonwealth Health Laboratory at Kalgoorlie as free from tuberculosis, he is entitled to a weekly benefit fixed by the Mine Workers' Relief Fund. This sum equals at its maximum 50 per cent. of the earnings of the class of worker to which the miner belonged increased by 7s. 6d. for each child, but not exceeding in the aggregate the basic wage from time to time ruling in the district in which the mine worker was employed when prohibited, up to a total sum of £750.

Thereafter, provided he has continued to contribute regularly to the fund as if he were a mine worker, notwithstanding that he has been prohibited from employment, he receives the benefits laid down in Scale I of the schedule (see p. 274). These benefits are likewise granted to a mine worker unable to prove to the satisfaction of the Minister all the circumstances necessary to entitle him to benefit as above referred to.

4. The dependants of a mine worker who has contributed regularly to the fund, and who dies before he has received the sum of £750, are as from the date of his death entitled to the balance of such sum in accordance with the benefits specified in Scale II of the second schedule (see p. 274).

No person shall be entitled to receive benefit due for any disease or malady legitimately attributable to the nature of his employment and at the same time to draw benefit under Division I of Part IV of the Act relating to prohibited and notified miners. No person shall be entitled to any benefit as above unless at the time he claims such benefit he is regularly contributing as a mine worker to the relief fund. The benefits payable under the Act commence from (a) the day following the date the mine worker ceased work at the mine if so employed when prohibited or notified, and (b) the date of his examination by a medical officer or practitioner appointed under the Act, if not employed at a mine when prohibited.

Dependants are not entitled to benefits unless they were totally or partially dependant on the mine worker during the twelve months preceding prohibition from employment or notification. In the case of partial dependants such sum is paid as may be approved by the Minister.

The rates of benefit are given in two scales contained in the second schedule of the 1933 regulations.

SCALE I

Weekly benefits for prohibited and notified mine workers and for their dependants who have exhausted their compensation (under the Workers' Compensation Act, 1912-1924) and/or the sum of £750 under the Mine Workers' Relief Act, 1932:

Guardians of infant dependants: 7s. 6d. per week for each child under the age of sixteen.

Married couples and widowers: 25s. per week and 5s. for each child under the age of sixteen years.

Single men: 25s. per week.

Widows: the rates of benefit vary according as to whether the widow is under or over forty years of age and has or has not children. No benefits are accorded for children over sixteen years of age.

Dependent mother or son: 10s. per week.

The maximum benefits in any case shall not exceed £2 5s. per week.

SCALE II

The dependants of a mine worker prohibited as suffering from tuberculosis without silicosis and who dies before he has received £750 are entitled to receive the balance of the said sum at the following weekly rates:

Widow, £2; parents, grandparents and step parents, £1 each person; children and brothers and sisters under sixteen, 7s. 6d. each.

Provided that (a) the maximum weekly payment to all dependants shall not exceed £3 10s.; (b) payment to a widow shall cease immediately on remarriage; (c) if the number of dependants is too great to permit of each being paid the prescribed rate without exceeding the maximum weekly payment, such dependants shall be paid on a pro rata basis; (d) when the said dependants have received the balance of the aforesaid sum of £750 they are then entitled to the benefits as specified in Scale I.

Any person found on compulsory medical examination or re-examination not to be suffering from tuberculosis is supplied with a certificate entitling such person either to continue working or to be employed as a mine worker. For those found to be suffering from tuberculosis or silicosis the procedure is as follows: The medical officer or practitioner must furnish a report of the case in writing to the Minister within seven days of the completion of the examination, stating the disease in question to be: (a) tuberculosis without silicosis, (b) silicosis with tuberculosis, (c) silicosis in the advanced stage, or (d) silicosis in the early stage and including (e) the number of men free from the diseases mentioned in the Act.

1. The Minister on receipt of the medical report serves upon the person named therein as suffering from tuberculosis without silicosis, a notice intimating prohibition from employment in, on or about any mine coming within the Act. Any mine worker served with such notice may within fourteen days thereafter

lodge an appeal with the Minister provided that the notice of such appeal has annexed thereto a certificate from a duly qualified medical practitioner that in his opinion the appellant is not suffering from tuberculosis. A register in prescribed form shall be kept in the Mines Department, in which shall be entered the names of mine workers who have been prohibited from employment and notice thereof in prescribed form shall be sent to the Board.

2. A mine worker named in the medical report as suffering from silicosis in the early or in the advanced stage without tuberculosis, is notified accordingly by the Minister, the notice adding that further employment underground at a mine may be detrimental to his future health.

A mine worker suffering from silicosis in the advanced stage without tuberculosis may be deemed to have become totally and permanently incapacitated for work and be entitled to the corresponding benefit or may continue to work as a mine worker and still be entitled to benefit if he ceases to work as a mine worker within twelve months after service upon him of notification of the disease. Benefit is, however, only payable from the day on which the mine worker ceases underground work.

A mine worker who has received notice when working underground that he is suffering from silicosis in the early stage without tuberculosis, and thereafter ceases to work underground within two years from receiving such notice, may within three months after the date when he ceases to work request to be registered at the Department of Mines according to a recognised procedure. Any person so registered may at any time submit himself for further examination at the Commonwealth Health Laboratory at Kalgoorlie and if found to be suffering from tuberculosis and silicosis, or silicosis in the advanced stage only, shall be notified accordingly by the Minister, such notice entitling the person in question to benefit which varies according as to whether the disease has been certified within a year of cessation of underground work or longer.

A certificate of prohibition from employment or notice in the prescribed form from under the hand of the Minister must be judicially noticed.

Application for compensation by a prohibited or notified mine worker or the dependant of such mine worker is addressed to the Secretary of the Mine Workers' Relief Board, Kalgoorlie.

Every employer of mine workers must furnish to the medical officer or medical practitioner or to the Under-Secretary for Mines a list of all mine workers from time to time employed by him whenever required to do so, afford reasonable facilities for mine workers to submit themselves, without loss of pay, to medical examination under the Act, and furnish the Board with all requisite information relating to mine workers in his employment.

Appeal against prohibition from employment is heard and determined by a Board and the decision of the majority of the said Board upon any question of fact material to the appeal shall be final and shall not be subject to appeal or to review by any court of law.

The amount of the equal contribution made to the relief fund by the employer and the mine worker is determined on the basis of the mine worker's earnings. The mine worker's contribution (as likewise that of inspectors, etc.) is paid into the fund by the employer after deduction from wages or salary as the case may be. The rate of the contribution is fixed in the 1933 regulations as 1s. 6d. per pay where the pay is half-monthly and 3s. per pay when the pay is monthly. Any mine worker prohibited from employment may continue to contribute regularly to the fund, the amount of such contribution being fixed by the Board.

The mine workers' relief fund also receives contributions and advances by the treasurer, and the proceeds of penalties imposed under the Act, the sum paid by the treasurer being equal to the total sum of the quarterly contributions paid in by employers and prospectors.

If at any time the moneys in the fund are in the opinion of the Board more than sufficient to meet the immediate requirements, the Governor may, by notice in the Government Gazette, exempt employers and mine workers from liability to contribute to the fund for such time as may be specified.

The Workers' Compensation Act 1912-1924 establishes the principle of employers' liability: the employer liable for compensation in the case in question is he who employed the mine worker at the date of the prohibition or notice, if he was then employed as a mine worker, or the employer by whom he was last employed as a mine worker under and in accordance with the Act.

When the right to benefits under the above liability are exhausted the Mine Workers' Relief Fund is substituted for individual liability on the part of employers.

This Fund is administered by a Board known as the Mine Workers' Relief Board and consisting of five members; two elected by the employers, two elected by the mine workers and a chairman appointed by the Governor.

The Board of Appeal consists of the principal medical officer or a deputy appointed by him and two duly qualified medical practitioners, one of whom is nominated by the appellant and the other by the Minister.

GREAT BRITAIN

An Act to consolidate the law relating to compensation to workmen for injuries suffered in the course of their employment. 15 and 16 Geo. V, c. 84. Dated 22 December 1925. (*L.S.*, 1925, Gr. Br. 3.)

An Act to extend section forty-seven of the Workmen's Compensation Act, 1925, to industries involving exposure to asbestos dust, and to amend the provisions of that section relating to medical arrangements and examinations. 20 and 21 Geo. V, c. 29. Assented to 1 August 1930. (*L.S.*, 1930, Gr. Br. 7.)

1. *Silicosis.*

The Metal Grinding Industries (Silicosis) Scheme, 1931, dated 30 April 1931, made by the Secretary of State under the Workmen's Compensation Act, 1925 (15 and 16 Geo. V, c. 84) and the Workmen's Compensation (Silicosis and Asbestosis) Act, 1930 (20 and 21 Geo. V, c. 29). (*Statutory Rules and Orders*, 1931, No. 343.)

The Refractories Industries (Silicosis) Scheme, 1931, dated 11 May 1931, made by the Secretary of State, under the Workmen's Compensation Act, 1925 (15 and 16 Geo. V, c. 84), and the Workmen's Compensation (Silicosis and Asbestosis) Act, 1930 (20 and 21 Geo. V, c. 29). (*Statutory Rules and Orders*, 1931, No. 345.)

The Sandstone Industry (Silicosis) Scheme, 1931, dated 20 May 1931, made by the Secretary of State under the Workmen's Compensation Act, 1925 (15 and 16 Geo. V, c. 84), and the Workmen's Compensation (Silicosis and Asbestosis) Act, 1930 (20 and 21 Geo. V, c. 29). (*Statutory Rules and Orders*, 1931, No. 346.)

The Various Industries (Silicosis) Scheme, 1931, dated 30 April 1931, made by the Secretary of State under the Workmen's Compensation Act, 1925 (15 and 16 Geo. V, c. 84) and the Workmen's Compensation (Silicosis and Asbestosis) Act, 1930 (20 and 21 Geo. V, c. 29). (*Statutory Rules and Orders*, 1931, No. 342.)

2. *Asbestosis.*

The Asbestos Industry (Asbestosis) Scheme, 1931, dated 30 April 1931, made by the Secretary of State under the Workmen's Compensation Act, 1925 (15 Geo. V, c. 84), and the Workmen's Compensation (Silicosis and Asbestosis) Act, 1930 (20 and 21 Geo. V, c. 29). (*Statutory Rules and Orders*, 1931, No. 344.)

3. *Medical Arrangements.*

The Silicosis and Asbestosis (Medical Arrangements) Scheme, 1931, dated 30 April 1931, made by the Secretary of State under the Work-

men's Compensation Act, 1925 (15 and 16 Geo. V, c. 84), and the Workmen's Compensation (Silicosis and Asbestosis) Act, 1930 (20 and 21 Geo. V, c. 29). (*Statutory Rules and Orders*, 1931, No. 341.)

The Silicosis and Asbestosis (Medical Fees) Regulations, 1931, dated 18 May 1931, made by the Secretary of State with the approval of the Treasury as to the fees to be paid in respect of examinations made and certificate given under the Silicosis and Asbestosis (Medical Arrangements) Scheme, 1931. (*Statutory Rules and Orders*, 1931, No. 412.)

In Great Britain provision for the payment of compensation to workmen contracting an occupational disease was first made in the general Workmen's Compensation Act of 1906. Before that Act came into force a Departmental Committee was appointed to consider what diseases could properly be included, and they considered that silicosis is a specific and sufficiently distinguishable trade disease and that employers might properly be required to pay compensation to their workpeople who contract the disease. They found, however, serious difficulties in the way of recommending the addition of the disease to the Third Schedule to the Act, but thought that it might be possible to devise special trade insurance schemes which would get over the difficulties. It was not until 1918 that the Workmen's Compensation (Silicosis) Act was passed, which enables the Secretary of State to make special schemes of compensation for this disease. This Act enables the provisions of the principal Act to be applied with the necessary modifications. It also provides for the inclusion in any scheme of the following principles:

(1) the establishment of a general compensation fund to which all the employers in the particular industries should be required to subscribe and out of which all claims for compensation and all expenses arising under the scheme should be paid;

(2) the settlement of claims by committees representative of both employers and workmen, with an independent chairman; and

(3) the appointment of special medical officers with expert knowledge of respiratory diseases for the examination and certification of cases arising under the scheme.

The first scheme made under the Act was that for the Refractories Industries (made in 1919). This scheme was the subject of an inquiry by a Departmental Committee in 1924, which recommended certain amendments, and further power having been obtained in the amending Act of 1924 the Scheme was revised in 1925.

The Acts of 1918 and 1924 were consolidated in section 47 of the Workmen's Compensation Act, 1925.

In 1930 a further Act was passed giving power to the Secretary of State to make a general scheme for the purpose of co-ordinating the medical arrangements in connection with all the compensation schemes for silicosis and to enable him to make similar schemes of compensation for workmen who contract asbestosis while employed in industries and processes involving exposure to asbestos dust. Under these powers the Silicosis and Asbestosis (Medical Arrangements) Scheme, 1931, was made, and came into force on 1 June 1931.

English legislation affords compensation for "the disease known as silicosis" (that is to say, "fibrosis of the lungs due to silica dust"), or "fibrosis of the lungs due to asbestos dust", or "either of these diseases accompanied by tuberculosis", which in the various schemes issued in administration of the Act are designated as follows: "silicosis or asbestosis, or either of these diseases accompanied by tuberculosis (pulmonary)".

The schemes merely constitute administrative regulations of the principle of compensation embodied in the main Act.

The various industries and processes, or groups of processes, or operations covered by the Act are specified in the various administrative schemes.

A. — SILICOSIS

(a) *Metal grinding*: According to Article 2 of the Scheme No. 343, it applies to workmen employed on grinding of metals, that is, the abrasion by aid of mechanical power of any metal by means of a grindstone, including any hacking or rodding of the grindstone; any work incidental to grinding and glazing of metal, as well as racing of any grindstone for the purpose of grinding of metals.

Provided that nothing in the scheme shall apply to operations which are only occasional or are not engaged in for more than eight hours in any week, and likewise mechanical grinding where the grindstone is enclosed and the metal ground immersed in water during the manufacture of files.

According to the provisions of the scheme, "grindstone" means a grindstone composed of natural or manufactured sandstone, and includes, for the manufacture of tools, a metal wheel

or cylinder in which blocks of natural or manufactured sandstone are fitted. "Rodding" includes "barring up" or "scarring", by means of dressing, of a surface of a revolving grindstone by the application of a rod, pole or strip of metal to such surface.

"Racing" means the barring up, cutting or dressing of a revolving grindstone at the factory before the grindstone is brought into use for the first time.

(b) *Refractories industries*: Article 2 of the Scheme No. 345 defines "refractories industries" as "all processes in or in connection with getting, handling, moving, breaking, crushing, grinding and sieving of refractory material in the manufacture of bricks or other articles carried on by mines, quarries, factories and workshops, the material got or manipulated containing not less than 80 per cent. total silica (SiO_2);

Provided that mines and quarries in which refractory material is only occasionally worked, iron or steel works in which refractory material is crushed, ground or pugged for use only in the works and quarries, in which the only refractory material worked is natural sand, shall not be deemed to be included.

(c) *Sandstone industry*: Article 2 defines the "sandstone industry" as all processes in or incidental to the getting or manipulation of sandstone, with a view to manufacture, sale or use, carried on at, or within the close or curtilage of any mine or quarry, etc.

The word "sandstone" includes "ganister", "gritstone" and "quartzite rocks", but does not include rotten stone or natural sand.

Nothing in this scheme shall apply to any mine or quarry, or other premises covered by the refractories industries (silicosis) scheme; any mine or quarry in which sandstone is worked occasionally only; any premises not being part of a mine quarry, etc., in which sandstone is manipulated for the manufacture of silica flour; employment as craneman, engineman, fitter, blacksmith or blacksmith's assistant, where the workman is exclusively employed at a place separate from any place in which other processes included in the industry are carried on; manufacture of artificial stone, except breaking, crushing or grinding of sandstone, etc.

The scheme likewise does not apply when the employer satisfies the authorities by chemical analysis, effected in accord-

ance with the prescribed conditions, that the sandstone got or manipulated does not contain more than 50 per cent. silica (free and combined). This exception is, however, without prejudice to any rights or liabilities which may have previously accrued under the scheme.

(d) *Various industries*: Scheme No. 342 applies to the processes of *mining and quarrying of silica rock* (quartz, quartzite, ganister, sandstone, gritstone and chert, exclusive of natural sand or rotten rock); drilling and blasting in silica rock in or incidental to the mining or quarrying of other minerals, or of coal (under special conditions), sawing, planing, dressing, shaping, cutting or carving of silica rock; breaking, crushing, grinding, sieving, mixing, packing, handling or moving of silica rock, or of dried quartzose sand, or any dry deposit or residue of slag or flint, or any dried mixture containing such materials, or any process ancillary thereto; in *foundries and metal works* engaged in the manufacture of steel or in steel foundries: crushing or grinding of silica rock, or any handling incidental thereto; crushing or grinding of bricks or other articles containing not less than 80 per cent. total silica (SiO_2); freeing of steel castings from adherent sand or other siliceous substances (fettling), except work done upon the foundry floor; sand blasting of metal by means of compressed air with the use of quartzose sand, or crushed silica rock or flint; *getting and manipulation of granite* (including any igneous rock), dressing of stones by masons, but not kerb dressing if the workman is wholly or mainly employed on such work; *potteries*: milling of flint, crushing or grinding of silica rock or dried quartzose sand; any process in or incidental to the manufacture of china or earthenware, up to and including the preparation for glazing, but excluding underglazed decorating, modelling and mould-making, where these processes are carried on in separate rooms; polishing, sorting or grinding on a power driven wheel; and finally *tin mines*: any operation under ground, as well as breaking, crushing of the ore or containing rock above ground, or any handling or moving incidental thereto.

B. — ASBESTOSIS

Scheme No. 344 covers, in the asbestos industry, breaking, crushing, distintegrating, opening, grinding and sieving or mixing of asbestos or any admixture of asbestos; all processes in the

manufacture of asbestos textiles, including the preparatory and finishing, processes; the making of insulation slabs or sections composed wholly or partly of asbestos; the making or repairing of mattresses composed wholly or partly of asbestos; sawing, grinding or turning in the dry state of articles composed wholly or partly of asbestos; the cleaning of any machinery or other plant used in any of the foregoing processes, and of any chambers, fixtures and appliances for the collection of asbestos dust.

Provided that nothing in the scheme shall apply to employment in the process of mixing of asbestos, or any admixture of asbestos, or sawing, grinding and turning in the dry state of articles composed wholly or partly of asbestos, or any cleaning of machinery or other plant used in any processes so specified, if such employment is occasional only and not for more than eight hours in any week; or any sawing, grinding or turning of articles composed wholly or partly of woven asbestos impregnated with bitumen or other bond of adhesive nature.

Compensation is provided in case of death or total disablement or suspension due to the diseases mentioned (silicosis and asbestosis), with or without tuberculosis of the lungs, due to work in the industries and processes specified.

Permanent suspension from work is sometimes considered necessary when the workman, though not totally disabled, is suffering from one of the diseases covered to such a degree as to make it dangerous for him to continue on the work in the process or industry covered by the scheme.

Right to compensation is not, however, accorded if the Medical Board certifies that the disease cannot have been contracted in the process owing to the shortness of the time during which the workman has been employed therein and likewise in cases where the workman has not been employed in the process or has not been in receipt of weekly payments under the scheme at any time within the three years previous to the date of the injury (or, if he has left the industry subject to certain reservations — sandstone industry scheme only) or, finally, where the workman or his dependants are already in receipt of compensation under any other scheme or enactment for silicosis or asbestosis whether in Great Britain or elsewhere.

If the workman has been employed in the industry for a period or periods amounting to not less than five years the disease shall be deemed to be due to employment in the industry

unless the employer proves the contrary. To obtain compensation the workman is obliged to submit himself to periodical medical examinations provided for under the scheme and not to re-engage in employment in any occupation involving risk of silicosis, in the industries covered by the various schemes or those covered by the Miners' Phthisis Act of the Union of South Africa.

Disability may be discovered either on the occasion of claim for compensation or in course of the medical examinations provided for under the scheme. Assessment of disability and certification of death is effected by the Medical Board.

1. *Claim for compensation.* Where a workman applies for compensation for total disablement or for permanent suspension from work he shall be examined by the Medical Board, which shall grant a certificate specifying to what degree the general physical capacity for employment is impaired by the disease.

Where the employer may agree with the workman that he is liable to pay compensation without requiring a certificate from the Medical Board the date of disablement shall be the date of the agreement or any such other date as may be agreed on by the two parties.

The date of "injury" shall be deemed to be the date on or from which a workman is certified to be totally disabled or is suspended from employment. In the case of death in the absence of any previous certificate certifying total disability or suspension from work, the date shall be that of the death.

Post-mortem examinations are effected by the Medical Board, which certifies whether death was or was not due to silicosis or to asbestosis, either simple or accompanied by tuberculosis.

Provided that where at the time of his decease weekly payments under the scheme were payable to the workman, the Medical Board may, if satisfied that a post-mortem examination is unnecessary, grant a certificate without such examination.

2. *Medical examinations*¹. If during medical examination on engagement or on later examination at prescribed intervals

¹ Compulsory medical examination before the end of the second month of employment or in exceptional circumstances within such extended period as the Medical Board may authorise is provided for

the workman is found to be suffering from silicosis or asbestosis or one or other of these diseases complicated by tuberculosis or if he is found to be unsuitable for work in the industry or process covered by the Act¹, his case shall be referred to the Medical Board who, after further medical examination, if necessary, shall suspend the workman from further employment and shall certify accordingly. Provided that suspension on engagement shall, however, not apply to skilled masons over twenty-one years of age (sandstone industry). Periodical medical examinations are effected by one or more members of the Medical Board at prescribed intervals. Suspension after periodical examination shall not apply, except on the written application of the workman, to workmen suffering from silicosis not complicated by tuberculosis aged forty-five or over (forty years for skilled masons in the sandstone industry) and

in the case of workers entering certain processes covered by the schemes. The same applies to workers who have worked on the processes covered by the Act but have not been medically examined under any compensation scheme within the preceding twelve months. Medical examination on engagement is carried out by a member of the Medical Board or other duly qualified medical practitioner specially appointed by the Secretary of State.

The standards with regard to physique are as follows: chest of average development; respiratory passages free from obstruction; no sign of disease of the lungs or heart; no tuberculosis of any region.

¹ Medical examinations on engagement and at prescribed intervals are provided for in the following industries and operations: refractories industries; sandstone industry; manufacture of china or earthenware, including sanitary earthenware, electric earthenware and earthenware tiles; grinding, etc. of silica rock or dried quartzose sand; handling of powdered flint or powdered silica in placing of the ware in saggars for biscuit firing; the operations of casting, pressing, dish-making, plate-making, etc., in the manufacture of earthenware; of casting and tracing in the manufacture of sanitary earthenware; the manufacture of tiles and certain processes in the manufacture of asbestos or of textiles and mattresses composed wholly or partly of asbestos.

Under the above-mentioned provisions medical examinations are effected at the following intervals: *once a year*, processes in the asbestos industry; *once every 18 months*, refractories industries (all persons employed in underground work in mines from which 80 per cent. or more of silica is got); in drilling, quarrying, breaking, crushing, grinding or sieving any such material; or in the process of moulding or kiln setting of ganister bricks or silica bricks containing not less than 80 per cent. of silica; sandstone industry: extraction processes — cutting, crushing or rockgetting, etc.; *once every three years*, refractories industries, sandstone industries (for all operations in regard to which the interval of eighteen months has not been fixed).

The Medical Board may require a re-examination at shorter intervals of individual workers in suspected cases in any of the scheduled processes or, in the case of a workman who is only occasionally employed in a process for which the prescribed interval is eighteen months, may direct him to be examined once every three years.

who have been employed for not less than twenty years in the industry or process covered.

The Medical Board shall have power in any case, where they consider necessary, to make or cause to be made a radiographic examination and shall in every case of suspension certify to what degree the physical capacity of the workman is impaired.

Compensation is paid in case of death, total disability or suspension from employment.

In case of death or total disablement the compensation payable under the scheme shall be determined in accordance with the provisions contained in the Workmen's Compensation Act.

In cases of total disablement compensation shall be payable from the date certified by the Medical Board as the date on which such disablement commenced or, if the Board has been unable to certify such a date, the date on which the certificate was given, or, in the case of agreement with the employer, such date as has been agreed upon.

In cases of suspension from employment, the workman not totally disabled receives:

(a) if the workman's general physical capacity for employment is impaired, while impairment continues, a weekly payment fixed in accordance with the provisions of the Workmen's Compensation Act (partial incapacity);

(b) if the workman's general physical capacity is not impaired but if he is unable to obtain after suspension suitable employment at a rate of remuneration not less than he was earning in the process, he shall receive a weekly payment fixed as follows:

(i) in the refractories industries and in the sandstone industry, a weekly payment for a period of two weeks from the date of suspension equal to the full amount of his wages, and thereafter, while he remains out of employment, for a further period not exceeding eleven weeks in all, in accordance with a decision of the Joint Committee, of a weekly sum not exceeding 50 per cent. of his weekly earnings calculated in accordance with the provisions of the Act;

(ii) in the asbestos and metal grinding industries and various industries such weekly payment as in the absence of

agreement the county court judge or other arbitrator may direct, provided that such compensation shall not be payable for more than thirteen weeks in all and shall in no case exceed 50 per cent. of the workman's average weekly earnings.

The amount of compensation shall be calculated with reference to the earnings of the workman under the employer from whom compensation is recoverable under the scheme.

Weekly payments may be revised and may, on application by the workman and with the consent of the Fund, be redeemed by the payment of a lump sum. Provisions in regard thereto are to be found in the schemes for the refractories industries and the sandstone industry. (If on suspension from employment a workman in the refractories industries or in the sandstone industry is compelled, in order to obtain suitable employment, to remove from the district, he shall be entitled to such sum, not exceeding £5, as the Joint Committee may consider reasonable in respect of the expenses of such removal.)

Expenses of medical attendance and burial shall, under the Workmen's Compensation Act, be payable by the Fund, provided that the workman leaves no dependants.

Procedure with regard to compensation described in detail in the various schemes is similar, except as regard compensation for silicosis, for workers in the sandstone and refractories industries. In regard to these provision is made for the establishment of a Compensation Fund.

Any workman desiring to make a claim for compensation for total or partial disablement must obtain a certificate from the Medical Board appointed by the Home Office, unless his employer agrees that he is liable to pay compensation without such certificate.

In practice, a workman desiring to obtain this certificate is advised to consult his approved society, which arranges for him to be examined by the regional medical officer appointed under the National Health Insurance Act. This examination is free of cost for the workman. If the regional medical officer is satisfied that there is reasonable cause for suspecting the existence of silicosis, he will provide a certificate entitling the workman to be examined by the Medical Board at a reduced fee. The workman must state the compensation scheme under which the claim is made, the name and address of the works of the

employer who last employed him in a process included in the scheme, the nature and duration of the employment, and the date when he left such employment¹.

If the workman fails to obtain the certificate from the regional medical officer, he may still decide to proceed with his application for examination by the Medical Board, but in that case he will be required to deposit the full cost of the examination, part of which will, however, be refunded to him if the Medical Board issues a certificate.

Before issuing any certificate, the Medical Board send a notice to the employer or to the Fund, where a Compensation Fund has been established under the scheme, and consider any statement made or submitted to them in writing by or on behalf of the employers or the Fund.

Except in cases of death the Medical Board are not required to issue a certificate unless the workman is found to be suffering from silicosis or asbestosis, or one or other of these diseases accompanied by tuberculosis, but an intimation of the result of the examination is sent to the workman in every case. No fee is payable for the certificate granted by the Medical Board to a workman certified to be suffering from one of the diseases covered at initial or periodic medical examination.

The certificate thus established is sent to the workman, who should then notify the claim for compensation direct to the employer responsible (asbestos industry, metal grinding industry, and various industries) or to the Joint Committee (refractories industries and sandstone industries).

In case of death from silicosis or asbestosis, or one or other of these diseases accompanied by tuberculosis, the dependants notify the Medical Board, which effects the necessary post-mortem examination.

The application should be accompanied by the medical certificate given by the Board, the fee prescribed by the Regulations, and all information as to the nature and duration of the deceased workman's employment. In cases where inquests are held, coroners are invited to consult with the Medical Board as to arrangements for the post-mortem examination, and to give the Board an opportunity either of making or of being represented at the examination.

¹ See GREAT BRITAIN, HOME OFFICE: *Memorandum on the Industrial Diseases of Silicosis and Asbestosis*. London, 1932.

Death certificates are forwarded either to the dependants or to the secretary of the Joint Committee.

The beneficiary, the employer, or the Fund for the industries in which a Compensation Fund exists, may at any time demand a revision of the benefit accorded on the basis of a certificate delivered by the Medical Board after re-examination of the workman. Provided that the Medical Board shall not be required to re-examine a workman more frequently than once in every three months for partial disablement, or, if he has been certified to be totally disabled, more frequently than once in every six months.

According to the result of this re-examination, any payments made may be ended, diminished, or increased. In the refractories and sandstone industries, such revision is effected by the Joint Committee, which has also power to modify sums paid to dependants.

This procedure involves a certain number of obligations on the part of employers and workers, which may be summarised as follows:

(a) It is the duty of every *employer*: to give notice to the Medical Board of his commencing to carry on any industry or process in regard to which medical examination of those employed on engagement is required; to arrange for the initial or periodic medical examination of his employees; not to engage or to continue to employ in any industry or process covered by the various schemes any workman who has refused or wilfully neglected to submit himself to any examination required under the scheme, or any workman who has been suspended or certified to be totally disabled by the Medical Board, except so far as may be allowed by certificate of the Medical Board; to furnish every workman required to submit to periodic medical examination with a register in the prescribed form, to be kept by the workman and produced when required by the employer or by the Medical Board, or other duly qualified medical practitioner, for the purposes of carrying out any of their duties under the scheme.

A duplicate thereof shall be kept by the employer and forwarded by him, when the workman leaves the employment, to the Medical Board.

(b) It is the duty of every *workman* to submit himself to periodic and other examinations provided for under the schemes,

not to re-engage in the industries covered by the schemes or in the South African mines after having been certified to be totally disabled or suspended from employment in the industries, except so far as may be allowed by certificate of the Medical Board. Further, it is the duty of dependants in the case of death to furnish to the employer from whom compensation is claimed true information as to the workman's employment with any previous employer within the course of the last five years preceding the date of the injury, and as to whether they are already in receipt of any compensation under any other scheme or enactment providing compensation for silicosis or asbestosis, or either of these diseases accompanied by tuberculosis, in Great Britain or elsewhere.

The employers, or under certain of the schemes the Fund, are required to send to the Secretary of State every year a correct return of the number of cases in respect of which compensation has been paid and the amount of such compensation, together with any other such particulars as the Secretary of State may direct.

The principle of liability of employers and the payment of compensation due from them, as laid down in the Workmen's Compensation Act, Article 47, is given effect to by two different methods according to the schemes in question.

One is based on the *individual liability of employers* : asbestos industry scheme, metal grinding industries scheme, and various industries scheme. In this case compensation is recoverable from the employer who last employed the workman in the processes covered, except that in the case of a newly-engaged workman who is suspended from employment in the processes at an initial examination, the employer from whom compensation shall be claimed and recoverable shall be the employer who last employed the workman in the processes previously to the new engagement. Any other employers who employed the workman in the processes during the five years preceding the date of injury shall be liable to make to the employer from whom compensation is recoverable such contributions as, in default of agreement, may be determined by arbitration under the scheme.

The other method is based on *collective liability*, effected by the establishment of a Compensation Fund, which is different in the refractories industries and in the sandstone industry, but

is administered in each case by a "company", and maintained by subscriptions paid by the employers. Any disputes as to questions arising under the asbestos or metal grinding or various industries schemes are settled as though they were questions in proceedings arising under the Workmen's Compensation Act, and in the case of the refractories industries and sandstone industry schemes such disputes are settled by arbitration according to a special procedure, decisions of the Joint Committees being final except in regard to misinterpretation of the provisions of the scheme, in which case appeal against the decision of the Joint Committee may be made to the Secretary of State, whose decision shall be final.

The rate of subscriptions, as well as the investment and management of Funds, are fixed by the company, in compliance with any directions given by the Secretary of State. The Compensation Fund, in the case of the sandstone industry, may adopt different rates of levy for different risks (composition of the sandstone, conditions under which the product is got or manipulated, or other special circumstances, etc.), and may apply such rates to different classes or groups of workers or processes, or to any particular works or process.

Every employer commencing to carry on any process to which the schemes applied, or recommencing to carry on any such process after having discontinued it for a period of twelve months, shall forthwith notify the company. He must further keep a correct record in writing of every workman employed by him in the industry, showing the number of days in each year the said workman is employed, the nature of the work upon which he is engaged, and the wages, salary, or other remuneration paid by him to the said workman during such employment. This information shall be placed at the disposal of the company as required.

The organisations appointed to administer the legal provisions relative to compensation of silicosis and asbestosis are: the *Medical Board*, consisting of specially qualified medical practitioners appointed by the Secretary of State. This Board at present consists of a Chief Medical Officer, whose headquarters are at Sheffield, and eight members, divided into four panels, each consisting of two members of the Board, with headquarters at Bristol, Manchester, Sheffield, and Stoke-on-Trent.

The Medical Board is responsible for carrying out all medical examinations and providing requisite certificates. Its decisions are final, which implies that it shall be furnished with all necessary information. It may further be called upon to act as "medical referee".

The Medical Board is administered by a Medical Expenses Fund, which regulates expenditure and collects fees payable in respect of examinations made in accordance with a special scheme (Medical Fees Scheme).

The Compensation Funds established under the schemes for the refractories industries and the sandstone industry are each administered by a company. The details in regard to their administration are laid down in the schemes in question.

Finally, in the above industries, administration of compensation is effected by a Joint Committee composed of equal numbers of employers' and workers' representatives, and presided over in each case by an independent chairman. The determination by a Joint Committee of any question assigned to it is final, and any question arising at any meeting may be decided by a majority of the votes of the members present.

NEW ZEALAND

An Act to consolidate certain enactments relating to old-age and other pensions. 17 Geo. V, No. 56. Dated 9 September 1926. Pensions Act, 1926. (L.S., 1926, N.Z. 4.)

Regulations dated 6 June 1927, under "The Pensions Act, 1926". (*New Zealand Gazette*, 1927, No. 39, 9 June, p. 1967.)

An Act to make provision with respect to public finance and other matters. 20 Geo. V, No. 29. Assented to 8 November 1929. Finance Act, 1929. (L.S., 1929, N.Z. 1.)

An Act to amend the Pensions Act, 1926. 23 Geo. V, No. 15. Assented to 19 November 1932. Pensions Amendment Act, 1932. (L.S., 1932, N.Z. 5.)

Act No. 50 of 11 October 1915 which for the first time gave legislative effect to compensation for miners' phthisis, together with the provisions relative to benefits contained in the Finance Acts of 1917 (Article 84), 1919 (Articles 7, 8 and 11), and 1930 (Articles 11-14) is repealed and replaced by Act No. 56 of 1926 and later legislative texts. Under the designation of miners' phthisis, the Act as amended includes pneumoconiosis and tuberculosis of the lungs and any other disease of the respiratory organs associated with or a sequel to pneumoconiosis.

The Act applies to any miner who contracted miners' phthisis while working as a miner in New Zealand. Every miner who is, or hereafter becomes totally incapacitated for work owing to miners' phthisis and who is thereby seriously and permanently incapacitated for work (not totally), shall during his incapacity be entitled to a pension provided that he is a British subject by birth or by naturalisation for at least one year; that he has resided continuously in New Zealand for not less than five years immediately preceding the date of his application; that he has been employed in New Zealand as a miner for a period of not less than two and a half years prior to the date of his application; that he is not in receipt of a military pension (1915 Act); that during the five years he has not been convicted of any offence punishable by imprisonment, and that he has a good moral character and sober habits.

If any miner entitled to a pension under the Act dies of miners' phthisis, and leaves a widow, his widow shall be entitled to a pension during widowhood.

Every application for a pension shall be accompanied by a certificate from an appointed medical practitioner testifying to the degree of incapacity.

Benefits are paid by the Pensions Fund without contributions on the part of the participant. In cases of total incapacity or serious permanent incapacity, the miner is entitled to a weekly pension at the rate of 25s. plus 10s. per week for his wife and 10s. per week for each child dependent on him.

Notwithstanding, the annual amount of pension payable to a miner in respect of any child or children shall be reduced by £1 for every complete £1 of his actual annual income (derived from any source other than a pension under this section) in excess of £104, and in no case shall the total rate of pension payable to a miner under this section exceed £4 5s. a week.

In the case of death of a miner, his *widow* shall be entitled during widowhood to a weekly pension of 17s. 6d. Benefit due to a deceased miner shall be paid to and for the benefit of his widow, or to any person having the control of any child or children of the said miner.

Reasonable *funeral expenses* shall be payable, the sum not to exceed £20, provided that no payment shall be made unless application for the same is lodged within twelve months after the date of death.

Application for a pension shall be accompanied by a certificate from an appointed medical practitioner, and where necessary by proof that the disease has been contracted in New Zealand, and shall be lodged with the Commissioner who shall make the final decision in regard thereto. The Commissioner may from time to time ask for re-examination of a pensioner by a medical practitioner and may terminate his pension as the result of such re-examination.

Such termination shall not bar the applicant from applying for a fresh pension should the incapacity recur.

All the general provisions of the law of 1926 apply equally to pensions accorded to miners suffering from phthisis.

UNION OF SOUTH AFRICA

An Act to consolidate and amend the laws relating to miners' phthisis, No. 35 of 1925. Assented to 27 July 1925. (Miners' Phthisis Acts Consolidation Act, 1925.) (*L.S.*, 1925, S.A. 2.)

Government Notice No. 411. Department of Mines and Industries. Dated 8 March 1926. To add the occupations mentioned in paragraph (b) of the Fourth Schedule to the Miners' Phthisis Acts Consolidation Act, 1925 (Act No. 35 of 1925.) (*Regulations*, 1926-1927, Vol. II, p. 1280.)

Government Notice No. 1602. Dated 10 September 1926. Regulations under the Miners' Phthisis Acts Consolidation Act, 1925. (*Regulations*, 1926-1927, Vol. II, p. 1280.)

Act to amend the law relating to miners' phthisis, No. 38 of 1930. Assented to 3 June 1930. (Miners' Phthisis Acts Further Amendment Act, 1930.) (*L.S.*, 1930, S.A. 6.)

Government Notice No. 1499, dated 22 August 1930... under.. section one of the Miners' Phthisis Acts Further Amendment Act, 1930. (Act No. 38 of 1930.) (*Government Gaz.*, 1930, Vol. LXXXI, No. 1893, p. 539.)

Compensation for silicosis was introduced for the first time in Act No. 34 of 1911 which provides benefits for miners suffering from miners' phthisis. This Act resulted later in the passing of Act. No. 19 of 1912 on miners' phthisis, amended by the Acts No. 29 of 1914, No. 44 of 1916, No. 44 of 1917 and No. 24 of 1918, all referred to as the "prior Law". There followed Act No. 40 of 1919 on miners' phthisis known under the name of the "principal Act" and Act No. 35 of 1924 amending the principal Act and known as the "previous Act". Act No. 35 of 1925 consolidates the Acts on miners' phthisis, and with the 1930 amendment is known as the "present Act".

According to the latter, the diseases known as miners' phthisis entitling workers to compensation are silicosis and tuberculosis.

Silicosis means silicosis of the lungs and the three following stages are distinguished in regard to this disease:

- (a) An ante-primary stage when it is found that the earliest detectable specific physical signs of silicosis are or have been present; whether or not capacity for work is or has been impaired by such silicosis;
- (b) A primary stage when it is found that definite and specific physical signs of silicosis are or have been present and that capacity for work is or has been impaired by that disease though not seriously and permanently;
- (c) A secondary stage when it is found that definite and specific signs of silicosis are or have been present and that capacity for work is or has been seriously and permanently impaired by that disease, or when it is found that tuberculosis with silicosis is or has been present.

Tuberculosis means tuberculosis of the lungs or the respiratory organs. A person is deemed for the purposes of this Act to be suffering from tuberculosis whenever it is found either:

- (a) That such person is expectorating the tubercle bacillus;
- (b) That such person has closed tuberculosis to such a degree as seriously to impair his working capacity and render prohibition of his working underground advisable in the interests of his health.

Only those engaged on certain operations in the mines covered are entitled to compensation.

The legislation in question covers only those mines in which the mineral dust produced is or has been of such a nature as to give rise to silicosis. These mines are divided into two categories: "scheduled" mines and "gazetted" mines.

In the "scheduled" mines, the list of which has been drawn up by the Minister for Industry and Mines and is published in the form of a notice in the Government Gazette in accordance with the recognised procedure, the Act is concerned with "underground" work. These mines, a list of which is appended to the Act, comprise "all operations in relation to underground work or employment beneath the surface; to work or employment upon or about rock crushers, in a crushing station, and to work or employment in a sample-crushing room or assay office or in a changehouse or on any tailings dump".

A miner is defined as any person engaged in any of the fifty-one occupations specified in one of the Schedules to the Act (a)

necessitating the incumbent spending 100 or more hours per month underground which renders him a "miner" during the month in which he is so employed. Employment in any of the thirteen occupations on the surface of a mine enumerated in the same schedule (b) renders the incumbent a "miner" during each day he is employed *underground*, if less than 100 hours per month.

In the "gazetted" mines the Act likewise covers all underground work just as in the case of "scheduled" mines.

Government inspectors, assistant inspectors and deputy or sub-inspectors are likewise covered by the Act in "scheduled" or "gazetted" mines.

Compensation is provided for incapacity or death due to silicosis or tuberculosis or both of these diseases contracted in the occupations specified. Right to compensation may be established when the worker or his dependants make a claim, or in the case of injuries revealed in the course of the medical examination prescribed under the Act.

Compensation is paid to a miner:

- (a) provided he satisfies the Board that he has silicosis or tuberculosis or both of these diseases, and that he is, or has been employed for a period totalling two years underground on a scheduled mine or a gazetted mine, or, if he has not served that period, he must satisfy the Board that he has contracted silicosis on such a mine.
- (b) for tuberculosis without silicosis if he presents symptoms of the disease and is either still working on a scheduled mine as a miner, or if not working, that he has not been out of work for more than twelve months before applying for compensation.

Any person in receipt of benefits for silicosis or tuberculosis with or without silicosis may not continue to be employed on underground work in "scheduled" or "gazetted" mines or in any other mine or on any other operation specified by the Minister.

The benefits provided under the Act are granted to Government inspectors, deputy inspectors, etc., independent of any pension or other benefit granted under the Pensions Act.

Dependants of a *deceased* miner or *native labourer* become entitled to any benefit which he was entitled to, or to a pension

if the medical board certifies that he had silicosis in the secondary stage or tuberculosis with silicosis, or that he died from silicosis or from any other cause with which silicosis was present as a contributing or predisposing factor.

Various temporary provisions regulate compensation for miners who had or had not received benefits in virtue of the preceding Acts. Thus, for example, those miners who served in the Army as volunteers and were refused benefits under the Miners' Phthisis Act or the War Special Pensions Act (No. 42 of 1919) may apply to the Medical Board of Appeal or to the Joint Medical Board, and certificates granted by these bodies shall be deemed as certificates of the Medical Board for the purposes of the Act.

Incapacity is discovered during examination by the Medical Bureau either in response to claims for compensation or in course of the medical examinations effected under the Act.

Deaths are certified by the same body in response to claims made by dependants. The Bureau may, whenever it considers necessary, proceed to make post-mortem examinations of deceased miners or native labourers.

Benefits are only granted on presentation of the certificate furnished by the Medical Bureau. In the case of incapacity the Bureau must certify that the patient is suffering from silicosis or tuberculosis, or both of these diseases, and, in the case of death, that the deceased worker suffered from silicosis or tuberculosis or both of these diseases, or that death was due to silicosis or to any other cause in regard to which silicosis was a contributing or predisposing factor.

The Medical Bureau is likewise called upon to detect incapacity and deliver the requisite certificates during the "initial" and "medical" examinations provided for under the Act¹.

¹ Miners and Native labourers are precluded from going or working underground except when in possession of a certificate granted subsequent to the above examinations. It is the duty of employers to afford every facility with a view to the medical examinations being carried out.

The "initial certificate" is granted after medical examination for any person who desires to enter for the first time upon employment as a full-time miner. The certificate indicates in the case of a miner passed as fit that the holder "is free from any disease of the lungs and respiratory organs, and is in other respects physically fit for underground work". The "initial certificate" is valid for six months. At the end of that period the holder becomes entitled to appear at "periodical examinations" as a "working miner".

Any person not considered fit is notified that the Medical Bureau cannot grant him the "initial certificate". At the "initial" examina-

If at periodical examinations the medical officer of the Bureau finds that the miner is suffering from "simple silicosis" or "tuberculosis with or without silicosis", a certificate is made out to this effect containing mention of the disease in question (and, in the case of silicosis, of the stage of the disease) and the miner receives the relative notification.

In the case of a miner suffering from *simple silicosis*, it is optional for him to apply to the Board for an award of compensation and leave underground work, or to remain at work and postpone taking an award. Should the miner, however, remain at work for a period longer than three months after the receipt of the notification that he has silicosis, he forfeits during his lifetime all right to an award other than that to which he would have been entitled at the date of his first notification. If the miner is suffering from tuberculosis with or without silicosis he is obliged to relinquish underground work immediately. Further, the Minister may, by notice in the Gazette, prohibit work in any non-scheduled or non-gazetted mine if such work is in his opinion likely to cause or aggravate existing silicosis. Any miner who has accepted an award as the subject of silicosis is debarred from underground work in the mines covered, and therefore ceases to be eligible for a periodical certificate.

tion of a Native a certificate is transmitted to the Director of Native Labour to the effect that the labourer is accepted for underground work, or is not accepted.

The "special" certificate is granted by the Bureau after examination, to a number of persons whose work takes them underground from time to time, but who are not full-time miners. This certificate testifies that the holder is not suffering from tuberculosis. When the contrary is the case the Board notifies the applicant that the "special certificate" cannot be delivered.

"*Periodical examination*" is the statutory examination of all working miners coming within the Act, who must present themselves for examination at intervals of not more than six months; in the case of Native labourers, three months.

"Working miners" who are not employed remain eligible for the periodical examination for an indefinite period provided that they present themselves for examination at intervals, of not more than two years from the date of expiry of the "initial" or "special" or last "periodical" certificate issued to them. If they fail to do so they are subjected again to an "initial" examination. The "periodical certificate" issued by the Bureau to "working miners" simply certifies that the holder "is not suffering from tuberculosis", and entitles him to continue in, or offer himself for employment in any of the operations specified above.

Once it has been granted, the certificate is periodically renewed in the case of all miners who remain eligible and submit themselves for periodical examination.

Native labourers found by the "medical examiner" to have signs of tuberculosis or silicosis are sent forward for examination and final disposal by the Medical Bureau. At the same time the Medical Bureau or the examiner notifies the Miners' Phthisis Board or the employer and the Director of Native Labour, as may be the case, of the particulars of all persons found to be suffering from silicosis, tuberculosis or from both diseases. Any Native found to be tubercular is forthwith discharged from underground employment.

Any Native labourer having worked underground is obliged on ceasing this work to be examined — ("final examination") — stethoscopically, by the Bureau, or by a medical practitioner nominated by the Bureau, and is not discharged unless he is found free from silicosis or tuberculosis. If he is found to be suffering from tuberculosis with or without silicosis, he is entitled to the benefits provided.

Miners and Native labourers in receipt of benefit may present themselves for medical examination within a time limit which varies according to the case. The results of such examinations are communicated by the Medical Bureau to the services concerned (Miners' Phthisis Board; Director of Native Labour).

Benefits accorded for incapacity and death may assume various forms: payment of a lump sum, payment of monthly allowances in accordance with the stage of the disease to be compensated and whether it is a question of miners or native labourers. Benefits in the case of death are established on the base of benefits for incapacity.

1. *Incapacity*

In the case of incapacity for *anteprimary silicosis*, the miner or native labourer receives a lump sum calculated as follows:

Twelve times that part of the miner's and Native labourer's month's earnings which did not exceed £29 3s. 4d., and six times that part of their month's earnings which exceeded £29 3s. 4d. but did not exceed £37 10s. and three times that part of their earnings which exceeded £37 10s.

In the case of silicosis of the *primary stage*, the miner and Native labourer receive a lump sum calculated in the said manner, but with an addition of 50 per cent. thereto. Those who receive benefit for anteprimary silicosis may, under certain conditions, if they subsequently develop primary silicosis, likewise receive the additional 50 per cent.

A miner suffering from *silicosis in the secondary stage* receives a monthly allowance, the amount of which is calculated as follows:

For the miner: one-half of that part of his month's earnings which did not exceed £20; and one-quarter of that part of his month's earnings which exceeded £20 but did not exceed £28 6s. 8d. and one-twentieth of that part of his month's earnings which exceeded £28 6s. 8d.; *for his wife:* one-fifth of the total amount payable in respect of the miner, increased by one-tenth of the said sum for each of the first three children and one-twentieth for each child from the fourth child onwards.

The monthly allowance is, under certain conditions, granted to the miner suffering from silicosis in the secondary stage even if he has already received a lump sum.

The Native labourer, in the case of silicosis of the secondary stage, receives the lump sum provided for silicosis of the antepimary stage, with an addition of 100 per cent. thereto.

In the case of *tuberculosis without silicosis*, the miner receives the lump sum provided for cases of primary silicosis. If he is already in receipt of benefit of a lump sum for antepimary silicosis, he is entitled to an increase of 50 per cent. of the first benefit accorded for primary silicosis. The Native labourer is entitled to a sum similar to that granted for primary silicosis found during the final examination, provided that he has been found to be suffering from the disease within six months after suspension from underground work, or after discharge or having terminated employment in a scheduled mine.

In the case of *tuberculosis with silicosis* a miner receives a monthly allowance even if he has already received a lump sum and similar to what he would receive in the case of silicosis in the secondary stage. A Native labourer is entitled to the lump sum provided in the case of ante-primary silicosis increased by 100 per cent.

2. Death

The dependants of a deceased miner (widow, children under sixteen and other persons specified in the Act) receive a monthly allowance calculated as follows:

- (a) widow or any child under sixteen years of age: double the allowance provided for a wife and children in the case of incapacity from silicosis in the secondary stage;
- (b) to any dependant wholly dependent upon the miner: a monthly allowance similar to that granted to a widow.
- (c) to any dependant partly dependent upon the miner: a monthly allowance equal to the amount of the average monthly support given by the miner during his lifetime. Such allowance not to exceed the allowance which would have been payable to the widow of the miner.

The Act provides a definition of dependants. The opinion of the Miners' Phthisis Board in this matter is final and not subject to review or appeal. No award of the benefits above-mentioned may be granted in respect of more than one dependant.

The dependants of a deceased Native labourer who has not received benefits are entitled to a lump sum equal to that granted for silicosis in the secondary stage or for tuberculosis with silicosis.

The Miners' Phthisis Board may, apart from benefits to dependants, pay out of the compensation fund in respect of a deceased miner a sum not exceeding £25 towards the reasonable expenses of his burial and of the medical attendance on him during, and other expenses incidental to, his last illness, if the miner in question has been granted benefits under the Act and if the Bureau is satisfied and certifies that he died from silicosis, or from any other cause if silicosis was present as a contributing or predisposing factor. In certain cases a miner who has been granted a monthly allowance and who desires to leave South Africa for other than temporary purposes may, at the discretion of the Board, be granted a passage to his destination for himself and any of his dependants together with a sum not exceeding £10 for incidental expenses.

Benefits payable either to the miner, Native labourer or dependants, are calculated on the basis of the monthly earnings of the said miner or Native labourer, meaning one-sixth part of the amount earned by the miner or Native labourer in question for the 156 days on which he worked as such, last prior to the date upon which he was first certified by the Bureau to have developed silicosis or tuberculosis to a degree entitling him to any benefit under the Act, provided that if, for any reason, this amount cannot be ascertained, the monthly earnings shall be taken to be a sum to be determined by the Board or the Director, as the case may be. Miners coming under previous legislation are subject to special provisions.

Benefits to children are paid up to the age of sixteen. Nevertheless, in the case of any child who is unable to earn a living by reason of ill-health, or physical or mental incapacity, and likewise in the case of dependants other than the widow or children, the allowance granted may be continued beyond the age of sixteen for so long as, in the opinion of the Board, it might have been

reasonably expected that the miner would have continued to contribute to the support of such dependants.

The monthly allowance granted to a miner or his dependants ceases in case of death of the said miner or his dependant. A widow or any dependant (other than a child under sixteen), is paid on marriage in lieu of the allowance granted a lump sum which is twenty-four times the monthly allowance up to the amount of £750.

The benefits in question are paid in the case of miners to dependants or any other person whom the Board may designate. In the case of Native labourers the sums are paid to the Director of Native Labour.

Every *claim for compensation* should be addressed to the Miners' Phthisis Board accompanied by documents proving that the miner is suffering from silicosis or tuberculosis or both of those diseases (medical certificate granted by the Medical Bureau), and that the conditions laid down in the Act are complied with (disease contracted in a mine covered by the Act, length of working experience, etc.). A similar claim must be lodged by the lawful representative of a deceased miner desiring recognition as his dependant.

The Board deals with every claim as soon as possible and requires that such medical examination as is prescribed shall be held, and later takes its decisions on the basis of certificates provided by the Medical Bureau. In the case of claims made by miners who have been found to have silicosis or tuberculosis or both, at a periodical medical examination, no further examination is required unless, however, such miners make application for further awards.

In the case of Native labourers, the initiative is taken by the Director of Native Labour who outlines procedure and receives and distributes the benefits accorded.

Revision of the benefits granted under the Act may either be effected at the request of the beneficiary, or the Board may of its own motion set aside or vary the benefit where it is satisfied that fraud or error has occurred necessitating modification, or that such modification is called for as a result of incomplete information being given.

The decision of the Miners' Phthisis Board or the Director of Native Labour (as the case may be) upon any question of fact shall be final and not subject to appeal. On the contrary, a

decision as to the grant or refusal of any benefit or as to any other of the functions of the Board or the Director (as the case may be) are subject to review by the Transvaal Provincial Division of the Supreme Court upon the ground of illegality or gross irregularity, but not otherwise.

Any miner or dependant of a miner may appeal to the Medical Board of Appeal if he is dissatisfied with the decisions of the Medical Board. Since the definition of "miner" in the Act describes him as "other than a Native labourer" it follows that Native labourers have no right of appeal to the Medical Board of Appeal.

The *funds required for the payment of benefits* and for the purpose of enabling the Board to carry out its functions are supplied by two sources: "The Miners' Phthisis Compensation Fund" and "The Gazetted Mines Fund".

The first receives quarterly sums levied by the Board from employers of scheduled mines, the Board fixing the rates of contributions in accordance with the amount required.

The amount levied from each employer is calculated as follows:

30 per cent. of the amount, in proportion to the earnings, in a scheduled mine during the previous period of three months, of the miners employed by such employer;

50 per cent. of the amount in proportion to the silicosis rate¹ for each mine;

20 per cent. of the amount in proportion to the sum taken for assessment of income tax in respect of the penultimate accounting period of such employer for that mine taxed under the provisions of the income tax.

For the second fund contributions are based on :

- (a) the earnings of miners and Native labourers employed during the previous three months;
- (b) the sum for which the person working the mine was assessed for normal income tax in respect of the penultimate accounting period;
- (c) the number of miners and Native labourers found by the Bureau to have contracted silicosis or tuberculosis and the amounts of benefits granted.

¹ The *silicosis rate* for each mine is ascertained annually by adding together the periods of employment on scheduled mines during the ten years preceding the dates on which the miners have been certified, during the five years ending on the thirty-first day of July last previous, and distributing the total period thus obtained among the employers in proportion to the aggregate period during which such miners were employed on a scheduled mine by each employer.

Employers are, subject to the provisions of the Act, *liable* for the compensation payable to miners, Native labourers and their dependants.

Employers are directly responsible for the payment of benefits to Native labourers in scheduled mines, and benefits due are paid to the director by the employer in whose employment the Native was engaged on underground work.

Where the mine is closed down or withdrawn from the list of scheduled mines the said amount shall on the application of the director be paid to him by the Board out of the compensation fund.

Funds for payment of benefit to miners are provided in the case of scheduled mines by the Compensation Fund and in the case of gazetted mines by the Gazetted Mines Fund. The Miners' Phthisis Compensation Fund, the sources of revenue of which have been described above, is used chiefly for the payment of benefits to miners and their dependants. It also serves to provide a contribution of an amount not exceeding half the cost of establishing and maintaining one or more sanatoria; for the creation of a reserve fund; and an outstanding liabilities fund¹; a trades and industries fund established for the purpose of enabling the Board to carry out certain functions.

The Gazetted Mines Fund, the sources of revenue of which have already been referred to, meets the expenses of benefits paid to miners and Native labourers employed on gazetted mines and to their dependants. Where a miner or Native labourer has worked partly in a gazetted mine and partly in a scheduled mine the liability for compensation of the respective funds shall be apportioned by the Board, whose apportionment shall be final.

In the case of benefits or allowances due to Government inspectors (including assistant inspectors, deputy-inspectors and sub-inspectors) the amount is paid out of the consolidated

¹ This fund was created to meet liabilities incurred by scheduled mines which have closed down or are withdrawn from the list of scheduled mines. It is incorporated under the compensation fund and the Government actuary determines annually the total outstanding liabilities of the compensation fund and apportions such liabilities between the various employers. The outstanding liability of each employer to the compensation fund becomes immediately payable to the Board when the mine of the employer is closed down or ceases operations. By arrangement between the Board and the various employers steps have been taken by the latter to set aside amounts annually against their outstanding liabilities, based on the probable life of each mine.

revenue fund of the Union: provided that if such inspector was at any time employed as a miner the Board shall refund to the consolidated revenue fund such portion of the amount so paid as it may deem equitable under the circumstances.

The body responsible for application of the Act is the *Miners' Phthisis Board* referred to above as "the Board". It consists of a chairman and not less than three or not more than six other members appointed by the Minister of Industry and Mines for a period of three years.

Apart from the payment of legal benefits provided for under the Act and levying the requisite contributions from employers, the functions of the Board include:

Providing for the training in trades or industries of beneficiary miners, their wives and children, and beneficiary widows and children;

Conducting a bureau or co-operating with other bureaux for the purposes of obtaining employment for such persons as are mentioned in the preceding paragraph;

Assisting financially, by means of loans or otherwise, in establishing or in carrying on any undertaking in which beneficiary dependants or dependants of beneficiary miners are employed or which undertakes to employ at the Board's request such dependants ;

Establishing or assisting in establishing co-operative workshops, etc.

The Board also collects all statistics and information relating to the incidence or cause of silicosis or tuberculosis, etc.

Health supervision in regard to compensation is effected by the Medical Bureau in conjunction with the Board. The members of the Medical Bureau are all full time officials. There are at present one chairman and eight examiners on this basis. The final decision is in all cases taken by the Bureau as a whole.

The Medical Bureau carries out all prescribed medical examinations (relative to claims for compensation from miners and miners' dependants, initial and periodical examinations, supervision of initial and periodical examination of Native labourers; certifying of incapacity or death in view of compensation) except in cases dealt with by the Medical Board of Appeal and the Joint Medical Board. It also assists the Board in collecting,

compiling and tabulating statistics and information relating to the incidence or cause of silicosis and tuberculosis.

The expenses of the Miners' Phthisis Board and the Medical Bureau are paid not out of the compensation fund but from the Consolidated Revenue Fund of the Union, i.e. from the general revenue of the country.

The Medical Board of Appeal consists of three medical practitioners with special knowledge of diseases of the lungs and respiratory organs, one of whom is appointed chairman, and its task is to deal with appeals submitted to it. It re-examines any miner who is dissatisfied on medical grounds with the certificate furnished by the Medical Bureau, and reviews any case brought up by a dependant dissatisfied with the decision of the Medical Bureau as to the cause of the miner's death.

The Joint Medical Board consists of two members of the Medical Bureau nominated by the chairman thereof, two medical men appointed by the Pensions Office and a chairman appointed by the Minister. It deals with cases of volunteers who have been refused benefits under previous legislation or under the War Special Pensions Act, 1919. Decisions made by a majority are final and without appeal.

To complete medical organisation under the Act a list of medical men authorised to carry out prescribed examinations or grant medical certificates is framed from time to time by the Minister and published in the Gazette. The employer is obliged to choose from this list the medical men called upon to effect medical examinations or grant certificates.

Any medical examination required as a condition precedent to a grant of benefits is carried out by the Bureau except in the case of those effected by the Medical Board of Appeal and the Joint Medical Board. Any other medical examination may be carried out by the Bureau or by any medical practitioner whose name appears on the above list.

Mine medical officers or "examiners" gazetted as such under the Miners' Phthisis Act and engaged for medical examination of and attendance on Natives and coloured persons employed in or about scheduled mines must give their whole time to this work; provided that if, in the opinion of the Minister, the circumstances do not require the engagement of a whole-time practitioner, the Minister may exempt the employer in question from this provision.

The medical practitioners in charge of the health supervision of Native labourers carry out the "initial", "periodical" and "final" examinations, the Bureau exercising a general supervision and control over the work. Every medical practitioner engaged on examination of miners or Native labourers must within three days after observing symptoms of tuberculosis or silicosis in any person under his charge report such case to the Bureau. Upon receipt of the report the Bureau shall examine the case and if upon such examination the Bureau finds that the person is suffering from tuberculosis or silicosis it shall notify the Board or the director, as the case may be, immediately.

Every medical practitioner who carries out any post-mortem examination upon the body of any person who was employed in or about any scheduled mine shall, if he finds on such examinations silicosis or tuberculosis to be present in the lungs of the deceased, send such lungs to the Bureau accompanied by his report thereon; provided that if any such person was employed in any of the occupations referred to in the fourth schedule to the Act the medical practitioner shall send such person's lungs to the Bureau accompanied by his report thereon whether or not he finds silicosis or tuberculosis to be present.

Every member of the Board or of the Bureau or of the Dust Prevention Committee and every person approved by the Minister as a medical practitioner may enter upon any scheduled mine premises in the exercise of any powers or in the performance of any duties conferred or imposed upon him by the Act.

The Act finally makes provision for the organisation of research in connection with the prevention of silicosis, for the issuing of administrative regulations, as well as for fines in cases of non-compliance.

ANALYSIS OF LEGISLATION

Countries	Diseases	Processes	Acts
ARGENTINA	Anthracosis Pneumoconiosis Siderosis Tabacosis.	(Not specified, as the law contains only mention of the diseases subject to compensation.)	Act of 11 Oct. 1915 and Decree of 14 Jan. 1916.
AUSTRALIA Common-wealth	Pneumoconiosis	Quarrying or stone crushing or cutting.	Act No. 24 of 14 Aug. 1930.
¹ New South Wales *	Fibroid phthisis or silicosis of the lungs (silicosis). Silicosis of the lungs accompanied by tuberculosis. Any other disease of the pulmonary or respiratory organs caused by exposure to silica or other dust.	Workmen employed in the sandstone industry as stonemasons, quarrymen, rockchoppers, or sewer miners in the county of Cumberland.	Acts Nos. 13, 1920 and 15, 1926. Workmen's Compensation (Silicosis) Scheme No. 1, 1927 (16 Sept. and variations of the said scheme gazetted 7 June 1929, 14 March 1930 and 20 Feb. 1933.
	Pneumoconiosis and (or) tuberculosis.	Metalliferous Mines at Broken Hill.	Act No. 36, 31 Dec. 1920; No. 22, 1 March 1927; No. 36, 29 Nov. 1929, and No. 43, of 23 Dec. 1929.
Queensland	Silicosis of the lungs. Miners phthisis. Pneumoconiosis. Pulmonary tuberculosis.	Mining or quarrying or stone crushing or cutting.	Acts 1916 to 1923: amendments 1925, 1926 and 1929.
Tasmania	Silicosis. Pneumoconiosis. Fibrosis.	Section 2 of the Act defines as follows the processes covered: "Mineral" includes coal and shale; "Mining operations" means: 1. the disturbing, removing, carting, carrying, sifting, smelting, refining, crushing, or otherwise dealing with or treating any rock, stone, quartz, clay, sand, soil, ore or mineral	Act No. 52, 15 Jan. 1929.

¹ The countries marked with an asterisk (*) possess special compensation legislation for silicosis.

Countries	Diseases	Processes	Acts
		<p>by any mode or method whatsoever for the purpose of obtaining metal or mineral therefrom ;</p> <p>2. any process in connection with the dealing with, treating, or handling any rock, stone, quartz, clay, sand, soil, ore or mineral for the purpose aforesaid;</p> <p>3. the dealing with, treating, or handling, in connection with any such process as aforesaid, of any by-products or residues produced by or arising from such process;</p> <p>4. the cutting, dressing, shaping, or working upon any stone, granite, marble, or other similar substance;</p> <p>5. the quarrying of blue metal, freestone, or limestone;</p> <p>6. the manufacture of cement (but the term does not include sluicing, dredging or any similar operation).</p>	
Western Australia *	Pneumoconiosis. Miners' phthisis.	Mining, or quarrying, or stone crushing or cutting.	Act No. 69, 21 Dec. 1912, and later amendments.
	Silicosis. Tuberculosis.	Any person occupied or employed in mining operations on, in or about any mine.	Act No. 37. 30 Dec. 1932.
Territory of North Australia	Pneumoconiosis.	Quarrying or stone crushing or cutting.	Ordinance No. 6, 13 May 1931.
BOLIVIA	Pneumoconiosis or mines disease. Anthracosis. Siderosis. Tabacosis. Pulmonary sclerosis.	(Not specified, as the law contains only mention of the diseases subject to compensation.)	Act dated 18 April 1928 and dated 11 June 1928.

Countries	Diseases	Processes	Acts
BRAZIL	Pulmonary tuberculosis. Any other... affection caused... by inhalation of organic or mineral dusts.		
	Pneumoconiosis. Tabacosis.	(Not specified as the law contains only mention of the diseases subject to compensation.)	Decrees dated 15 Jan. 1919 and 12 March 1919.
BULGARIA	Anthracosis.	Miners and cast-iron-foundry workers; flue cleaners.	Act 6 March 1924 and Regulation 25 June 1924.
	Byssinosis.	Spinners and cardroom workers in the cotton industry.	
	Chalicosis and siderosis.	Grinders.	
	Chalicosis, siderosis, and tuberculosis.	Needle grinders, sculptors, polishers, lime slakers.	
	Chalicosis and tuberculosis.	Stone cutters.	
	Silicosis and byssinosis.	Flax and hemp workers.	
CANADA Alberta	Pneumoconiosis which shall be deemed to be: silicosis, siderosis, lithosis.	Quarrying, cutting, crushing, grinding or polishing of stone, or grinding or polishing of metal; mining.	Act of 1918.
Ontario	Stone workers' or grinders' phthisis.	Quarrying, cutting, crushing, grinding or polishing of stone, or grinding or polishing of metal.	Act 1914 and later amendments.
	Silicosis.	Mining.	
	Pneumoconiosis.	Quarrying, cutting, crushing, grinding or polishing of stone, or grinding or polishing of metal.	

Countries	Diseases	Processes	Acts
Saskatchewan	Miners' phthisis. Stone workers or grinders' phthisis. Silicosis. Pneumoconiosis.	Mining. Quarrying, cutting, crushing, grinding, or polishing of stone, or grinding or polishing of metal. Mining. Quarrying, cutting, crushing, grinding, or polishing of stone, or, grinding or polishing of metal.	Act 2 Feb. 1929.
CHILE	Diseases caused by inhalation of dusts, pneumoconiosis.	(Not specified as the law contains only men- tion of the diseases subject to compensa- tion.)	Decrees dated 18 March 1925 and 21 April 1927.
CZECHO- SLOVAKIA	Serious pneumoco- niosis due to quartz or iron dust. If serious pneumoco- niosis occurs simul- taneously with pul- monary tuberculo- sis, the tuberculosis shall for the purposes of compensation be deemed to be pneu- moconiosis.	(a) Undertakings for quarrying, rough work- ing, and finishing sand- stone; (b) chinaware under- takings; (c) metal grinding; (d) mining; where as a rule work is done in hard quartz rock.	Act 1 June 1931.
DENMARK	Diseases of the lungs caused by the inha- lation of stone dust and mineral sub- stances.	Manufacture of cleaning powders. Porcelain and ceramic industries. Stone industry. Certain branches of the metal industry (grin- ding, sandblasting, moulding, cleaning). Cement industry. Brick and tile works. Millstone industry.	Act No. 183 of 20 May 1933.
GERMANY	Serious pneumoco- niosis (silicosis). If serious pneumoco- niosis occurs simul- taneously with pul- monary tuberculo- sis, the tuberculosis shall for the pur- poses of compensa- tion be deemed to be pneumoconiosis.	(a) Undertakings for quarrying, rough work- ing and finishing sand- stone; (b) undertakings for me- tal grinding; (c) chinaware under- takings. (d) Mining underta- kings.	Order 11 Feb. 1929.

Countries	Diseases	Processes	Acts
GREAT BRITAIN*	Silicosis (that is to say fibrosis of the lungs due to silica dust) or fibrosis of the lungs due to asbestos dust or either of those diseases accompanied by tuberculosis.		Act 22 Dec. 1925, Act 1 Aug. 1930.
	More explicitly, the various compensation schemes issued under the above Acts specify as follows the diseases to be compensated:		Silicosis Schemes Nos. 342, 343, 345, 346, and 341 and 412, 1931.
	Silicosis or silicosis accompanied by tuberculosis.	<i>Metal grinding industries.</i> Grinding of metals on grindstones composed of natural or artificial sandstone and certain incidental processes ¹ .	Silicosis Scheme No. 343.
		<i>Refractories industries.</i> Getting and manipulation of highly siliceous materials (containing not less than 80 per cent. total silica), in the manufacture of silica bricks and other articles for lining furnaces ¹ .	Silicosis Scheme No. 345, 11 May 1931.
		<i>Sandstone industry.</i> Getting and manipulation of sandstone (containing more than 50 per cent. silica (free and combined) with a view to manufacture, sale or use at mines or quarries or on premises worked in conjunction with a mine or quarry ¹ .	Silicosis Scheme No. 346, 20 May 1931.
		<i>Various industries.</i> Mining and quarrying of silica rock. Drilling and blasting in silica rock in, or incidental to the mining	Silicosis Scheme No. 342, 30 April 1931.

¹ The descriptions given are summarised, since in the original text the description of processes is extremely detailed in each of the various compensation schemes.

Countries	Diseases	Processes	Acts
	Asbestosis and asbestosis accompanied by tuberculosis.	<p>and quarrying of other mineral, including coal. Getting and manipulation of granite (including any igneous rock).</p> <p>Foundries and metal works: crushing and grinding of silica rock or bricks, or other articles containing not less than 80 per cent. total silica; fettling of steel castings; sand blasting with use of quartzose sand, crushed silica rock or flint.</p> <p>Potteries: certain specified operations involving exposure to silica dust in or incidental to the manufacture of china or earthenware, including sanitary earthenware, electrical earthenware, and earthenware tiles.</p> <p>Tin mines: all underground and certain surface operations (breaking or crushing of the ore) ¹.</p> <p>Breaking, crushing, disintegrating, opening and grinding of asbestos, mixing or sieving of asbestos; manufacture of asbestos textiles, insulation slabs, or sections or mattresses composed of asbestos; other manufacturing processes carried on in the same room as any of the foregoing processes; sawing, grinding or turning in the dry state of articles composed of asbestos; cleaning of machinery and plant used, and of chambers, fixtures and appliances for the collection of asbestos dust ¹.</p>	Asbestosis Scheme No. 314, 30 April 1931.

¹ The descriptions given are summarised, since in the original text the description of processes is extremely detailed in each of the various compensation schemes.

Countries	Diseases	Processes	Acts
JAPAN	Silicosis. Tuberculosis.	Mines.	Regulation of 3 Aug. 1916 concerning Miners' Relief and later amendments.
MEXICO	Anthracosis.	Miners (in coal mines, charcoal burners, stokers using coal, chimney sweeps).	Act 18 Aug. 1931.
	Silicosis.	Miners (mineral and metalliferous mines), quarry workers, lime burners, cement factory workers, grinders and masons, workers in sandpits, workers employed in chinaware factories.	
	Tuberculosis.	Miners when silicosis has been incurred previously.	
	Siderosis.	Ironworkers (file cutters, metal turners and persons engaged in handling oxide of iron).	
	Tabacosis.	Persons employed in the tobacco industry.	
	Other lung diseases due to the inhalation of dust.	. . . painters and cleaners using compressed air (sprayers).	
NEW ZEALAND*	Miner's phthisis (pneumoconiosis).	Miners.	Pensions Act No. 56, 9 Sept. 1926.
SOUTH AFRICA*	Miner's phthisis (silicosis or tuberculosis or both of these diseases).	Scheduled mines (occupations specified by the Act).	Act No. 35, 27 July 1925, and amendments.
SWEDEN	Silicosis. Pulmonary tuberculosis accompanied by silicosis.	Dry boring in mines and quarries. Crushing and working up of mineral and rocks in a dry condition. Grinding with natural and artificial stone. Crushing and mixing in a dry condition of materials for glass manufacture. Manufacture of china. Sandblasting.	Royal Notification No. 31, 13 March 1931.

Countries	Diseases	Processes	Acts
SWITZER- LAND	Pneumoconiosis, and, in particular, silicosis.	—	Decision of the Governing Body of the National Accident Insurance Fund dated 11-12 May 1932.
U.S.S.R.	Pneumoconiosis.	Coal miners, ore miners, persons employed in the silicate industry, grinders and sharpeners.	Order No. 49, 20 Jan. 1931.

CONCLUSIONS

The agenda of the 1934 Conference, as shown in the short account of proceedings on page viii, consists of two parts as far as regards the question of the partial revision of the 1925 Convention on compensation for occupational diseases: (A) one part relative to the partial revision of the said Convention with a view to including in the schedule in Article 2 of a certain number of occupational diseases comprising silicosis; (B) a second part, the aim of which is the substitution for Articles 3 to 10 of the Convention of the new standard Articles approved by the Conference in 1929.

A.

As has been seen, the Correspondence Committee on Industrial Hygiene of the International Labour Office, at its 1926 and 1928 meetings, proposed a schedule of occupational diseases for compensation which was submitted on those dates to the Governing Body.

By its decision of February 1933, the Governing Body adopted the schedule of diseases placed on the agenda of the 1934 Conference, and requested that the final form to be given to the schedule for insertion in the Convention should be drafted by the competent service of the Office in accordance with the opinion of certain members of the Correspondence Committee on Industrial Hygiene. The form of the extended schedule to be included in the table figuring in Article 2 of the 1925 Convention will therefore be as follows:

List of diseases and toxic substances	List of industries or corresponding processes
Silicosis with or without tuberculosis.	Any industry or process involving exposure to the risk of silicosis as defined by the competent national authority.
Phosphorous poisoning or its sequelae.	Any process involving production, liberation or utilisation of phosphorus and its compounds.
Arsenic poisoning or its sequelae.	Any process involving preparation, liberation or utilisation of arsenic and its compounds.

List of diseases and toxic substances	List of industries or corresponding processes
Poisoning by benzene, its homologues and their nitro and amido derivatives or its sequelae.	Any process involving production, liberation, preparation or utilisation of benzene, its homologues and nitro and amido derivatives.
Poisoning by the halogen derivatives of hydrocarbons of the aliphatic series.	Any process involving production, liberation, preparation, or utilisation of halogen derivatives of hydrocarbons of the aliphatic series.
Pathological manifestations due to (a) Radium and other radioactive substances, (b) X-rays.	Any process involving exposure to their action.
Epitheliomatous cancer of the skin.	Any process involving exposure to the handling of tar, pitch, bitumen, mineral oil, paraffin or all compound products or residues of these substances.

B.

The second point in respect of which the revision of the Convention is upon the Agenda of the Conference is:

“The substitution for Articles 3-10 of the Convention of the new standard Articles approved by the Conference in 1929.”

Articles 3-10 were as follows :

Article 3

The formal ratifications of this Convention under the conditions set forth in Part XIII of the Treaty of Versailles and in the corresponding Parts of the other Treaties of Peace shall be communicated to the Secretary-General of the League of Nations for registration.

Article 4

This Convention shall come into force at the date on which the ratification of two Members of the International Labour Organisation have been registered by the Secretary-General.

It shall be binding only upon those Members whose ratifications have been registered with the Secretariat.

Thereafter, the Convention shall come into force for any Member at the date on which its ratification has been registered with the Secretariat.

Article 5

As soon as the ratifications of two Members of the International Labour Organisation have been registered with the Secretariat, the Secretary-General of the League of Nations shall so notify all the Members of the International Labour Organisation. He shall likewise notify them of the registration of ratifications which may be communicated subsequently by other Members of the Organisation.

Article 6

Subject to the provisions of Article 4, each Member which ratifies the Convention agrees to bring the provisions of Articles 1 and 2 into operation not later than 1 January 1927 and to take such action as may be necessary to make these provisions effective.

Article 7

Each Member of the International Labour Organisation which ratifies this Convention engages to apply it to its colonies, possessions and protectorates, in accordance with the provisions of Article 421 of the Treaty of Versailles and of the corresponding Articles of the other Treaties of Peace.

Article 8

A Member which has ratified this Convention may denounce it after the expiration of five years from the date on which the Convention first comes into force, by an act communicated to the Secretary-General of the League of Nations for registration. Such denunciation shall not take effect until one year after the date on which it is registered with the Secretariat.

Article 9

At least once in ten years, the Governing Body of the International Labour Office shall present to the General Conference a report on the working of this Convention and shall consider the desirability of placing on the agenda of the Conference the question of its revision or modification.

Article 10

The French and English texts of this Convention shall both be authentic.

They are, it will be noted, of a formal character, and relate to such matters as the coming into force of the Convention, the conditions under which it may be denounced, and the effect of its revision. In 1929 the Conference, after a long discussion, came to the conclusion that these Articles, which had been included in much the same form in all Conventions adopted before that date, were unsatisfactory, and it adopted in substitution for them, for insertion in future Conventions, new and revising, a modified set of Articles.

It will be remembered that when considering the revision of the Night Work (Women) Convention, 1919, at its Sixteenth Session, the Conference found that the question placed upon its agenda had been worded in such a way that it was not entitled, under Article 6 (a) of its Standing Orders, to substitute for the standard Articles of the original Convention the improved standard Articles drafted in 1929. Attention was called to the resulting inconvenience and, with a view to preventing the

recurrence of the difficulty, the Governing Body has expressly included in the agenda of the present session the revision of these Articles. The Articles approved by the Conference at its Twelfth Session in 1929 were in the following form:

Article (a)

The formal ratification of this Convention under the conditions set forth in Part XIII of the Treaty of Versailles and in the corresponding Parts of the other Treaties of Peace shall be communicated to the Secretary-General of the League of Nations for registration.

Article (b)

This Convention shall be binding only upon those Members whose ratifications have been registered with the Secretariat.

It shall come into force twelve months after the date on which the ratifications of x Members of the International Labour Organisation have been registered with the Secretary-General.

Thereafter, this Convention shall come into force for any Member twelve months after the date on which its ratification has been registered.

Article (c)

As soon as the ratification of x Members of the International Labour Organisation have been registered with the Secretariat, the Secretary-General of the League of Nations shall so notify all the Members of the International Labour Organisation. He shall likewise notify them of the registration of ratifications which may be communicated subsequently by other Members of the Organisation.

Article (d)

A Member which has ratified this Convention may denounce it after the expiration of y years from the date on which the Convention first comes into force, by an Act communicated to the Secretary-General of the League of Nations for registration. Such denunciation shall not take effect until one year after the date on which it is registered with the Secretariat.

Each Member which has ratified this Convention and which does not, within the year following the expiration of the period of y years mentioned in the preceding paragraph, exercise the right of denunciation provided for in this Article, will be bound for another period of z years and, thereafter, may denounce this Convention at the expiration of each period of z years under the terms provided for in this Article.

Article (e)

At the expiration of each period of t years after the coming into force of this Convention, the Governing Body of the International Labour Office shall present to the General Conference a report on the working of this Convention and shall consider the desirability of placing on the Agenda of the Conference the question of its revision in whole or in part.

Article (f)

Should the Conference adopt a new Convention revising this Convention in whole or in part, the ratification by a Member of the new revising Convention would, notwithstanding the periods of delay mentioned in the foregoing Article (d), involve the immediate denunciation of this Convention, provided that the new revising Convention has come into force.

As from the date of the coming into force of the new revising Convention, the present Convention would cease to be open to ratification by the Members.

Nevertheless, this Convention would remain in force in its actual form and content for those Members which had ratified it but had not ratified the revising Convention.

Article (g)

The French and English texts of this Convention shall both be authentic.

A further modification in Article (f) was made in 1933, when it was included in the Conventions adopted at the Seventeenth Session, in the following form:

Should the Conference adopt a new Convention revising this Convention in whole or in part, then, unless the new Convention otherwise provides,

- (a) the ratification by a Member of the new revising Convention shall, *ipso jure*, involve the immediate denunciation of this Convention, notwithstanding the provisions of Article (d) above, if and when the new revising Convention shall have come into force;
- (b) as from the date when the new revising Convention comes into force, this Convention shall cease to be open to ratification by the Members.

This Convention shall in any case remain in force in its actual form and content for those Members which have ratified it but have not ratified the revising Convention.

Whether or not this change should be made permanent will be discussed by the Standing Orders Committee of the Governing Body in time to enable a definite Recommendation to be made to the Eighteenth Session of the Conference. If it is decided to include the changed form, or some variation of it, in all future Conventions, it will be natural to include it in the revising Convention upon industrial diseases. It is believed that there are no aspects of the question strictly peculiar to the case of the industrial diseases Convention. The only question involved is that of bringing the formal Articles of an old Convention into line with the general practice of the Conference at the

present time. The established custom is for the formal Articles to be added to the texts of proposed Draft Conventions by the Drafting Committee of the Conference. In these circumstances the most appropriate course would seem to be for the Conference to pass a resolution worded as follows:

“The Conference instructs its Drafting Committee to insert in the text submitted to it for the final vote the standard Articles inserted in the other Conventions adopted at the present Session of the Conference in replacement of Articles 3-10 of the 1925 Convention.”

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